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HMM

SINGAPORE

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THE POWER TO DECIDE

THINK

- MOBILE SHOPPING TAKES FLIGHT
- WHY THE APPLE WATCH WILL SELL LIKE HOTCAKES
- UBER OF THINGS

LEARN

- BIOLOGICALLY DISTINCT: A LOOK AT BIOMETRICS
- SCIENCE OF WATCH COMPLICATIONS

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THE MACHINES HAVE RISEN. YOU JUST DON'T KNOW IT YET.

Last month, I talked about how technology has permeated every aspect of our lives. As a proponent of technology being an enabler, I of course welcome this brave, new modern world.

But...

We've all watched enough sci-fi to know that one of these days, humanity will be enslaved by our robot overlords. Some might say that this day has already come to pass.

While we're looking over our shoulders for that global, extinction-level event such as Judgement Day from the Terminator movie franchise and sentient killer robots to descend from the skies, we fail to see that technology is actually a sneaky bastard and have been using us all along. Think *The Matrix* instead.

What I'm talking about is the ubiquitous smartphone. Everywhere you go today, you'll notice people glued to the soft soothing lights of their smartphone screens – reading, viewing, tapping and swiping at whatever our mobile masters ask of us. I too, often partake in this guilty pleasure and think nothing of it.

Never before have there been any one device that could encapsulate an entire existence as the smartphone today can. As we explore new frontiers of mobile developments in this issue of HWM, from smarter cognitive processors to virtual reality to expanded online services, there is a realization that the day is soon approaching that you can truly live off a smartphone alone.

In fact, we probably already do. Social, communication, productivity, entertainment, finance, fitness, travel, retail; name one essential service that your smartphone cannot yet do for you.

It won't cook your food you say? Well, I'm pretty sure there's an app for that too. Delivery is just a tap away after all.

The convenience of online, on-demand access to services both local and global has made our world a smaller place. But, who is really the master here?

Blue pill, red pill. It's just a matter of perspective.

Zachary Chan
EDITOR

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GROUP EDITOR-IN-CHIEF

CAROLINE NGUI nguislc@sph.com.sg

GROUP EDITOR

JIMMY TANG jimtang@sph.com.sg

EDITORIAL

(editorial@hardwaremag.com)

Editor

ZACHARY CHAN zachchan@sph.com.sg

Deputy Editor

NG CHONG SENG csng@sph.com.sg

Associate Editor (Creative Services)

ALVIN SOON asoon@sph.com.sg

Associate Features Editor

JAMES LU jameslu@sph.com.sg

Senior Tech Writers

KENNY YEO kennyyeo@sph.com.sg

MARCUS WONG cmwong@sph.com.sg

Tech Writers

WONG CHUNG WEE wongcw@sph.com.sg

SALEHUDDIN HUSIN salh@sph.com.sg

EDITORIAL SUPPORT**Senior Manager, Administration
and Editorial Support Unit**

JULIANA CHONG julianac@sph.com.sg

Manager

ALICE HAN tayaha@sph.com.sg

Coordinator

YOLANDA ZHUANG yolandaz@sph.com.sg

CREATIVE

(creative@hardwaremag.com)

Associate Creative Director

JAYSON ONG jaysono@sph.com.sg

Art Director

KEN KOH kenkoh@sph.com.sg

Graphic Designer

IAN CHONG ianchong@sph.com.sg

Chief Photographer

VERONICA TAY verontay@sph.com.sg

Executive Photographers

FRENCHESCAR LIM frenchl@sph.com.sg

TAN WEI TE tanweite@sph.com.sg

Photographers

DARREN CHANG darrenc@sph.com.sg

JASPER YU jaspery@sph.com.sg

VEE CHIN veechin@sph.com.sg

VERNON WONG vernwong@sph.com.sg

WINSTON CHUANG wchuang@sph.com.sg

WONG WEI LIANG wongwl@sph.com.sg

ZAPHS ZHANG teolc@sph.com.sg

Editorial Support Executive

JACQUELINE YIK jacyik@sph.com.sg

MANAGING DIRECTOR

DENNIS PUA dennisp@sph.com.sg

GENERAL MANAGER

PANG LEE CHENG panglc@sph.com.sg

ADVERTISING SALES

(sales@hardwaremag.com)

Associate Ad Sales Director

KEVIN FOO kevinfoo@sph.com.sg

Senior Account Manager

FION YIP fionyip@sph.com.sg

MARKETING**Team Head**

VICKY YONG yongwmv@sph.com.sg

Executive

TEN HUI LING tenhl@sph.com.sg

PUBLISHING SERVICES**Team Head**

ALICE CHEE siewyuen@sph.com.sg

Team Leader

LISA YONG lisayong@sph.com.sg

SPHmagazines

CHIEF EXECUTIVE OFFICER

LOH YEW SENG lohys@sph.com.sg

STRATEGIC DEVELOPMENT DIRECTOR

FOONG SEONG KHONG foongsk@sph.com.sg

PUBLISHING SERVICES DIRECTOR

LEONG TSCHENG YEE leongty@sph.com.sg

CORPORATE COMMUNICATIONS HEAD

CHIN SOO FANG soofang@sph.com.sg

VICE PRESIDENT, HUMAN RESOURCES

IRENE LEE leebl@sph.com.sg

INTERNATIONAL LICENSING

PANG LEE CHENG panglc@sph.com.sg

INTERNATIONAL OFFICES**Indonesia Rep. Office**

Martin Wijaya (Chief Editor)
PO Box 6169 JKUPL 14440
Jakarta, Indonesia
Tel: (62) 21 612 0233/0955
Fax: (62) 21 6220 2580
Email: info.id@hwzcorp.com

Malaysia Rep. Office

Michael Low (Editor)
Lot 7, Jalan Bersatu 13/4,
section 13 46200 Petaling Jaya
Selangor, Malaysia
Tel: (60) 3 7952 7000
Fax: (60) 3 7960 0148
Email: sales.my@hwzcorp.com

Philippines Rep. Office

Marvin R. Velasco (Editor)
Unit B-2, Topy Main Building, No. 3
Economia Street, Bagumbayan,
Quezon City 1110, Philippines
Tel: (63) 2634 9179
Fax: (63) 2634 9180
Email: sales.ph@hwzcorp.com

Taiwan Rep. Office

Dennis Chou (Asia Media Contact)
2F-2, No.35, Sec 2,
Fushing South Road,
Taipei 106, Taiwan
Tel: 886-2-8773-4199
Fax: 886-2-8773-4200
Email: sales.tw@hwzcorp.com

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Fax: (65) 6319-6227. Ad Sales enquiries Tel: (65) 6319-6326

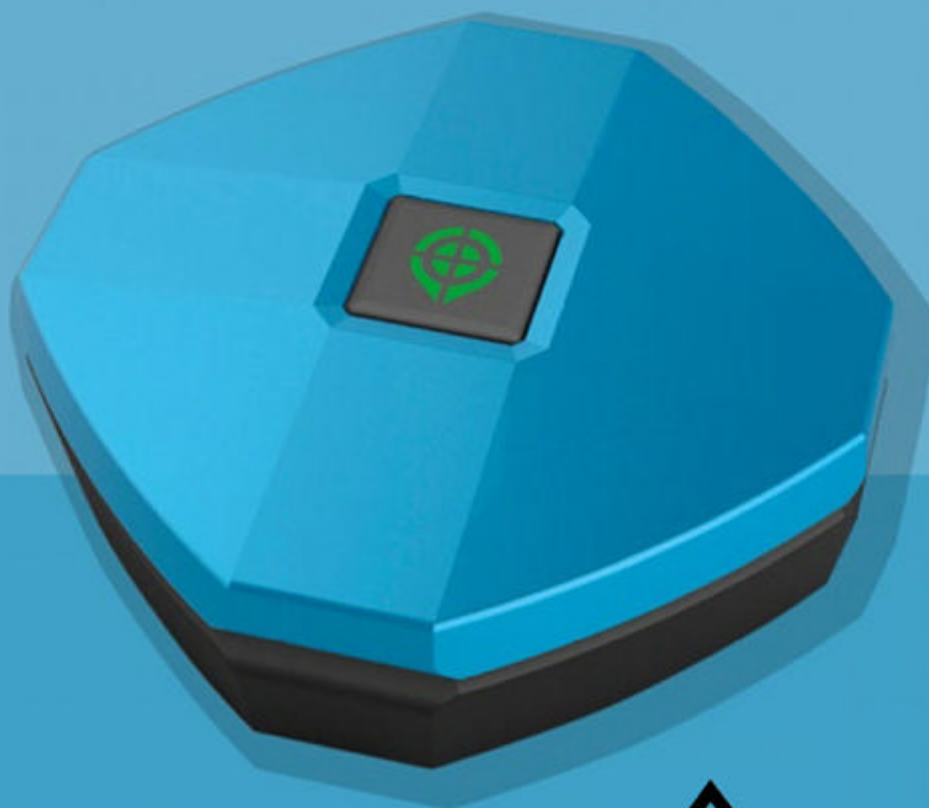
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NEW THIS MONTH

Every month, we receive dozens of product announcements and mentions, sit through many a launch event and try out all kinds of devices. All these products are then carefully curated by our crack team of tech gurus. The final list is presented here in Gear and it is our hope you'll find something to geek-out to.



MORE INSIDE >

SAMSUNG NX500

What is an NX1 in a smaller body?

ASUS ZENBOOK UX305

Super slim, super quiet, super zen.

IMPECCA BT KEYBOARD

When geeks pretend to go green.

FERRARI 488 GTB

What? We can dream too.

ASPENTA VECTU

Aspenta introduces three new lines of Vectu locator products which allow companies to track their assets globally at low flat rates and zero roaming charges. Its unique technology combines the best cellular triangulation with GPS location to provide the most consistent and reliable sources. It also features live tracking in real time, hibernation, and alarm sensors (S.O.S). Plus, you never have to worry about where you park that car again!

IMPECCA BLUETOOTH BAMBOO KEYBOARD

Bring a touch of nature into the office with the Impecca Bluetooth Bamboo keyboard, a well designed portable offering from Impecca that features a bamboo panel on the rear that automatically positions the keyboard in the ideal position for ergonomic comfort while typing.





ZTE BLADE S6

The ZTE Blade S6 is the first smartphone powered by Qualcomm's Snapdragon 615 octa-core processor and running on Android 5.0 Lollipop. The S6 also boasts a sleek aluminum body design and a 13MP Sony rear camera, as well as a wide-angle 5MP front-facing camera.



CANON MAXIFY MB5370

Canon's new Maxify printer series can be seen as a cross between its Pixma and Imageclass printers, driving performance in both print quality and speed. Leading the pack is the MB5370, a 4-in-1 multi-function inkjet with a host of business-oriented features, such as a 500-sheet paper input capacity, a single-pass, duplex ADF, and print speeds of up to 23ipm (B/W) and 15ipm (color).

SAMSUNG NX500

The NX500 builds upon the tech of the flagship NX1 in a more compact body.

It features the same 28MP BSI APS-C sensor, NX Autofocus System III and DRIME V processor for great low-light imaging, speedy focusing and 4K video recording. Not surprisingly, a smaller body means no built-in EVF and flash.

The NX500 also has a slightly slower 9fps shooting rate, but should otherwise be just as good as the NX1.





LG 55UF9500 PRIME UHD TV

The LG 55UF9500 4K TV features the company's ColorPrime technology, which uses different LED phosphor colors to create greater image depth and realism.

Powered by WebOS 2.0, this smart TV also touts a 8.5mm ultra-slim design and an integrated Harman Kardon sound system.

ASUS ZENBOOK UX305

The ASUS ZenBook UX305 is touted as the world's slimmest 13.3-inch Ultrabook and measures just 12.3mm thick. It also only weighs 1.2kg. This is made possible with Intel's new power efficient Core M processors, which require no active cooling, allowing for super slim, super quiet designs. Additionally, the ZenBook UX305 comes with 4GB of RAM and a 128GB SSD as standard.



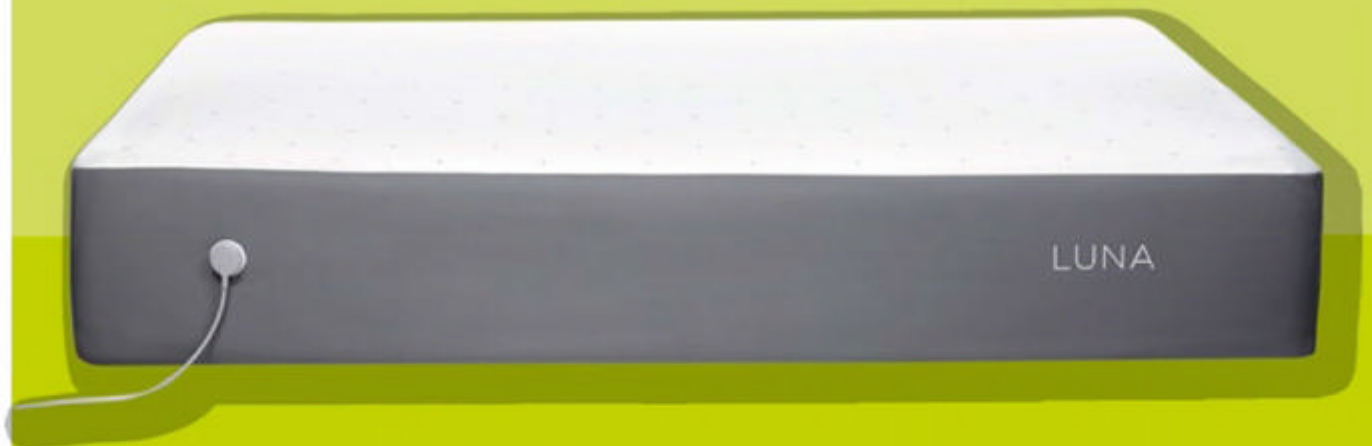


FERRARI 488 GTB

As the successor to the awesome 458 Italia, this new berlinetta Ferrari will also be turbocharged. Specifically, it features a 3.9-liter V8 with twin-turbochargers capable of 661hp and a massive 760nm of torque. This means 0-100km/h is dealt with in just 3 seconds and 200km/h can be seen on speedometer in just 8.3 seconds. Top speed is said to be in excess of 330km/h. You wouldn't expect anything less from Ferrari right?

LUNA SMART MATTRESS COVER

Turn your bed smarter with the Luna Smart Mattress Cover. Use it to warm or cool your bed through a smartphone, or let it learn your sleep habits via built-in sensors. It even allows separate temperature zones for you and your partner, sleep tracking data, and a smart alarm that wakes you at an ideal time to minimize groggy mornings.





GREUBEL FORSEY GMT BLACK

Greubel Forsey makes some of the most outrageous and most exquisitely finished timepieces and the new GMT Black is a worldtimer that displays local time along with a second timezone on the dial. A cities disc on the back shows the time around the world. The most intriguing thing though is the rotating globe at eight o'clock that functions as a day/night indicator.

BOOSTCASE

The Boostcase combines a slim-fitting snap case providing lightweight everyday protection with a built-in 2,700mAh capacity power bank. Available for the iPhone 6 and iPhone 6 Plus sizes, the Boostcase is the perfect way to extend your battery life without adding (too much) extra bulk.



MISFIT BOLT

The Misfit Bolt is a smartphone controlled, color-changing bulb that works without a control hub. Its accompanying smartphone app is free and it allows you to download Scenes that cycle the bulb through a set of color patterns. If you are feeling creative, you are even create your own Scene!





LENOVO VIBE SHOT

Lenovo's new VIBE Shot is a 5-inch smartphone with Full HD display that features some serious camera capability. The 16-megapixel rear camera uses a full-frame 16:9 sensor optimized for low-light.

And it comes with infrared autofocus, a physical shutter button and tri-color flash that ensures that optimally exposed images, no matter the lighting conditions.

A PHOTOGRAPH FOR EVERY LIFE

Whether you love to travel, party into the night, scale mountains, or just love taking photographs, Olympus has a camera that's right for you.

FOR THE AVID PHOTOGRAPHER

The OM-D E-M5 Mark II is a best in class camera that's been designed for people who love to take photographs, professional or otherwise. It features the world's most advanced 5-axis image stabilization system, which is so responsive that you can shoot sharp images in low light and capture steady video, all handheld without using a tripod. It's built to shoot anywhere, with a durable body that's splash, dust and freezeproof. The 40MP shooting mode – a world's first – captures ultra high-resolution images using sensor shift technology, and the built-in Wi-Fi lets you share high-quality images to smart devices.

OM-D E-M5 MARK II



BUILT TO TRAVEL

With its ultra-slim premium body, the OM-D E-M10 is built to travel. It makes remarkably sophisticated technology fun and easy to use, with excellent image quality thanks to Olympus' optical and image processing heritage. A large, bright electronic viewfinder (EVF) provides a bright, clear and responsive window to the world, and the 3-axis in-body image stabilization counters camera shake, giving you steady and sharp images even in low light. After you get the shot, use the built-in Wi-Fi to share your travels to a smart device and the rest of the world.

OM-D E-M10



ADVENTURE IS OUT THERE

If scaling a mountain face, diving into the ocean or dashing down the rapids is more your thing, the Stylus TG-860 Tough is the camera you'll want to be your adventure buddy. Waterproof to 15m, shockproof to 2.1m, freezeproof to -10°C freezeproof and crushproof to 100kgf, the TG-860 is designed to endure anywhere. Plus, it's the first Tough camera with a 180 degree tilting screen for selfies anywhere, even underwater! A Sportcam mode shoots High-Speed Movies for cool slow-motion playback, and the built-in Wi-Fi lets you shoot remotely, as well as send your action photos easily to smart devices.

TG-860



WHEN LIFE IS A PARTY

The PEN E-PL7 combines distinctive looks with modern features for the smartphone user, making it the perfect partner for a day and night on the town. It's the world's first mirrorless camera with a clever flip-down selfie-screen, letting you frame the perfect selfie with stunning image quality. The 3-axis in-body image stabilization counters handshakes, and makes sure your photos are sharp and steady. Apply creative Art Filters for that extra dash of style, and use the built-in Wi-Fi to smoothly transfer your photos to smartphones or tablets.

PEN E-PL7

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E-M5 Mark II

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PHILIPS SHQ1200



DESIGNED TO STAY ON

The Philips SHQ2200 is designed to stay on, no matter how intense your workout gets. Its unique, patented adjustable ear hooks, and three choices of anti-slip rubber ear cap sizes make sure it stays on – always. Weighing only 8gm, all you'll feel with them on is the robust sound coming from the 13.6mm drivers. The SHQ2200 is also sweat resistant and rainproof, ideal for workouts indoors or out, and the cable is Kevlar-reinforced for ultimate durability, with a reflective stopper for safety.

PHILIPS SHQ2200



FOR FREEDOM OF MOVEMENT

The Philips SHQ1217 is ideal for the athlete who needs his space. A 1.2m long cable with iPhone remote control and mic lets you put your audio device where you want it and still have control over your music. The headphones are ultra lightweight, and the headphones as well as the mic and controller are both waterproof. Ultra-soft silicon caps sit comfortably in your ears, blocking outside noise while you enjoy bass thumping stereo sound, while three sizes of soft ear sleeves help you fit the headphones perfectly to your ears.

PHILIPS SHQ1217



STAY FOCUSED AND CONNECTED

Stay focus and motivated on whatever workout you're doing with the lightweight & sweat-resistant SHQ3217 headphones. The iPhone mic and remote lets you switch from music to phone calls, while the adjustable ear hooks make sure the headphones stay securely on. Ultra-soft silicon caps make for a comfortable fit, while the light 8gm headphones help you stay agile. The cable is Kevlar-reinforced for strength, and the headphones are sweat resistant plus rainproof, making them ideal for any workout. Put the SHQ3217 on and you'll be rocking to the excellent sound generated from the 9mm drivers, with added deep bass for that extra kick.

PHILIPS SHQ3217

Award Winning Philips Fidelio Masterpieces



Award Winning Surround on Demand Series just got even better with the new Fidelio B5 Soundbar Speaker with Stand-alone portable wireless speakers



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NEW



Philips Fidelio M2L

Headphone with lightning connector
Ideal for iOS device lovers

COMING SOON



The M2L headphones deliver Fidelio's signature sound in high resolution on your iOS device, without distortion or crosstalk, thanks to a lightning connector and built-in DAC. Enjoy pristinely detailed sound anywhere, in style.

Philips Fidelio NC1

Noise cancelling headphone
Ideal for frequent travellers'

NEW



Enjoy superior noise cancellation with the Fidelio NC1. All you get is uncompromised high fidelity sound without the noise. Compact foldability and long-wearing comfort make it the best sound companion for long haul or daily commutes.

Philips Fidelio M2BT

Wireless bluetooth headphone
Ideal for wireless listening experience

NEW



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PHILIPS

MIRROR, MIRROR ON THE DESK

The latest designer portable HDD from LaCie comes with a ebony wood stand. Covered by mirrored Corning Gorilla Glass 3, this 1TB, USB 3.0 portable drive will also double up as a mirror on your desktop. According to its French designer, Pauline Deltour, each unique wood stand "contrasts sublimely" with the reflective surfaces of the mirror. Sublime or not, we think it's stylish piece of work!

LaCie Mirror



SMARTER SURVEILLANCE

PROLiNK True Plug & Play IP Cameras take less than 3 minutes to set up and utilize True P2P streaming, ensuring no data gets stored online that might compromise your privacy. The most popular model, PROLiNK PIC1007WP comes with Dual Lens (2 separate lenses for day/night mode), pan/tilt capabilities and megapixel resolution. Store footage in a microSD card (up to 64GB), NAS or directly to a PC. Plus, view live footage from a PC or free iOS and Android apps. **PROLiNK PIC1007WP**



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Simply answer this question:
"What type of secured streaming
protocol do the PROLiNK IP
cameras utilize?" and send it to
maghwm_promo@sph.com.sg
along with your full name, NRIC,
date of birth, address and
contact number by
30 April 2015.



ON-EAR STYLE

The MDR-ZX660AP is a stylish pair of on-ear headphones that have a separated ground cable to minimize cross talk for absolute stereo clarity. A tangle-free flat cable means you can stuff it all into your bag without worry, while the in-line remote with microphone lets you take calls with having to hold on to your phone. **Sony MDR-ZX660AP**



REMOTE CONTROL YOUR APPLIANCES

A compact device that plugs into any electrical socket, the D-Link DSP-W215 smart plug allows you to turn on and off electronic devices on a schedule. Since it can be connected to D-Link's Mydlink Cloud platform, you can also control and monitor it remotely with a mobile device. It also has a built-in thermal sensor to prevent overheating. **D-Link DSP-W215**

LIKE A KINGPIN

The EVGA GeForce GTX 980 Kingpin is built for overclockers and power users. Sporting a 14+3 digital VRM and 12-layer PCB, it ensures efficient and smooth power delivery. The card's ports have been arranged to allow for a single slot design with liquid cooling kits. Its existing ACX 2.0+ cooling system boasts of a pair of double ball bearing cooling fans that cool its heat sink, embedded with five 8-mm straight heat pipes. The card has a base clock speed of 1,304MHz and a boost clock of 1,418MHz; its 4GB of GDDR5 runs at the default speed of 7,010MHz. **EVGA GeForce GTX 980 Kingpin**



MAIKU ME UP

The MyMaiku looks like a classic microphone, but actually is a speaker that streams music wirelessly from any Bluetooth source for a good five hours of playback. Built with a powerful suction stand that lets you place it anywhere, the speaker also features an integrated microphone so you can make handsfree calls even when you're at the wheel. **Nakamichi MyMaiku**



SMALL SIZE, BIG SOUND

Available in a choice of Black, Blue, Pink or Red, the Music Cube Mini is a compact wireless speaker that pairs easily via NFC and Bluetooth, and features a microSD slot for all your music and audiobook needs. The entire speaker is a box that measures just 80mm x 90mm x 85mm, and weighs no more than 480g, making it the perfect travel companion. **Nakamichi Music Cube Mini**



MAINSTREAM HERO

The new MX200 is Crucial's successor to last year's successful MX100 SSD. Targeted at mainstream users, the MX200 is powered by a Marvell 88SS9189 controller and uses Micron's 16nm 128Gbit NAND. It also features Crucial's new Dynamic Write Acceleration technology to help boost write performance. Apart from the standard 2.5-inch form factor, the MX200 will also be offered in mSATA and M.2 form factors. **Crucial MX200**



BLAST PROCESSING!

Combining the two greatest things in the universe, a Sega Mega Drive and Megatron, is genius! Fully transformable, this action figure even comes with the old school controller with the ABC buttons (instead of the later 6 buttoned ones) and a miniature Sonic 2 cart! The only downside? It's not an actual functional Mega Drive console. Oh, there's also a Playstation Optimus Prime coming next year. **Mega Drive Megatron**



MICHELIN STAR REFRIGERATOR

Samsung brought together world-class Michelin star chefs and their R&D teams to create this Chef Collection refrigerator. Designed with advanced temperature control capabilities that keep fluctuations to 0.5-degree Celsius and various specialty zones for optimum food cooling and preparation. It even has a compartment that can switch between fridge and freezer as needed. If you have a particular obsession about how different types of food should be stored, this is the fridge for you. **Samsung Refrigerator RF9900**



SOUNDS SO RICH

Like bass? Then you'll love the MDR-ZX770BT Bluetooth headphones. With 40mm Neodymium drivers specially tuned for rich bass and clear mid-highs, these wireless headphones also pamper your ears with wrap-around cushions so soft, you won't want to take them off. **Sony MDR-ZX770BT**



RING RADIATOR SPEAKERS

In keeping up with wireless speaker trend, Samsung's WAM7500 is a funky egg-shaped device. This speaker can be mounted on a stand or suspended to look like an ornamental lamp. With its proprietary Ring Radiator audio technology, the WAM7500 is able to fill entire rooms with sound as it allows the audio waves to flow in a 360-degree radius. **Samsung WAM7500**

BREATHING NEW LIFE TO PHOTOS

This case basically turns your smartphone into an instant camera. But, there's more, you can have your photos come to life with an augmented reality function. A short video clip is shot prior to the picture being taken and can be viewed when you scan the printed photo through the Prynt app. **Prynt**

AFFORDABLE MONO LASER PRINTER

Not everyone needs a multi-function printer. For students and home users who just require solid monochrome print quality, there's the Fuji Xerox DocuPrint P115 w. Priced at \$79, this Wi-Fi-enabled laser printer has a print speed of up to 20ppm, a resolution of 2,400 x 600dpi, and a 150-sheet input tray. **Fuji Xerox DocuPrint P115 w**



GO EPIC

A rugged, GPS mapping watch for the great outdoors, ePIX is targeted at adventurers who need a navigational device that can be strapped to their wrists. It comes with a 1.4-inch color touchscreen and 8GB of internal storage for topographical maps. This is the stuff that epic adventures are made of!

Garmin ePIX

POCKET ZOOMER

Slim and stylish, Canon's new IXUS 170 has a 12x zoom lens that covers a 25-300mm range, expandable to 24x with almost no loss in quality and yet remains lightweight and small enough to fit into your pocket, making it a perfect companion for anything from that evening date to a holiday safari.

Canon IXUS 170

EXTREME POWERLINE NETWORKING

Prefer a wired connection over Wi-Fi? The Trendnet TPL-420E2K is a Powerline 1200 AV2 kit that includes two TPL-420E adapters. Supporting Powerline 1200 networking over existing electrical lines, installation is a cinch as the adapters are able to auto connect out of the box. Each adapter is also equipped with a gigabit Ethernet port. **Trendnet TPL-420E2K Powerline 1200 AV2 Adapter Kit**



CLEANING WITH A CYCLONE

The Powerbot VR9000 from Samsung features huge improvements over previous generation robot vacuum cleaners. With its Digital Inverter and CycloneForce technologies, it has up to 60x more suction power. A new FullView Sensor, larger wheels and elevated body means it will traverse your home like an offroad vehicle. No more getting stuck over obstacles like rugs and cables. **Samsung Powerbot VR9000**



THEY CALL ME BIG

The Aegis is a versatile MATX case designed to match any full-tower cooling performance. It supports up to eight 120mm fans (or five 140mm fans with dual 280 radiators or a 360 and 240 combo. Whoa!) It also comes with pump and reservoir brackets if you want to go the liquid route. To top it off, the logo at the front is actually an LCD display, allowing you to customize to whatever image you desire. Cool. **Bitfenix Aegis**



ENERGIZING THE IPHONE 6

If you've an iPhone 6 and found its battery life wanting, check out the Tytl Energi Sliding Power Case. Weighing 127g, this low-profile, \$139 protective case has a 3,200mAh lithium-ion battery that more than doubles the iPhone 6's battery life. The dual-layer inner case with raised bezel also protects your screen from scratches. **Tytl Energi Sliding Power Case for iPhone 6**



GET FIT IN COLOR

The Striiv Fusion comes with a removable touchscreen module and a range of fun, colorful wristbands to personalize your life. There's three right in the box for you to get started straight away too. Besides activity and tracking, the Striiv Fusion can also manage call and text alerts when synced with your smartphone, plus run other smartwatch apps. **Striiv Fusion Tracker**

HOTSPOT BREW

Touted as the world's first Wi-Fi enabled coffee machine, the Smarter Coffee lets you wake up to a perfectly-brewed cup of coffee every morning. Using its iOS or Android app, you can configure Smarter Coffee to decant its brew as it wakes you up. If you aren't an early bird, instruct Smart Coffee to whip up an evening pick-me-up as you make your way home from work! **Smarter Coffee**

WIN a Striiv Fusion tracker, worth \$149!

Simply answer this question: "How will Striiv Fusion help you achieve your fitness goals?" and send it to maghwm_promo@sph.com.sg along with your full name, NRIC, date of birth, address and contact number by **30 April 2015**.

EXCLUSIVE

\$20 off when you purchase a Striiv Fusion at www.axtrosports.com/striiv-fusion.html Just key in **hwmfusion15** when you checkout your shopping cart to enjoy the offer. Valid from **1 April to 6 May**.



TOUCH FOR POWER

The Luxa 2 TX-P2 isn't just your average 10,000mAh power bank. Ok sure, it has a proper 2.1A output port that allows you to charge your devices via cable. However, it also comes with a Qi wireless charging pad to allow wireless charging possible for any Qi-compatible devices. What's more, it supports simultaneous wired and wireless charging. **Luxa 2 TX-P2**

JAM ON

It's lightweight, features NFC and it connects to your smart phone via Bluetooth for excellent sound thanks to the Neodymium drivers that offer a frequency response of 20Hz to 20kHz. But that's not all. Connect it to your pc via USB and you'll get crystal clear audio with the advantage of Sound Blaster SBX Pro Studio processing. **Creative Sound Blaster Jam**

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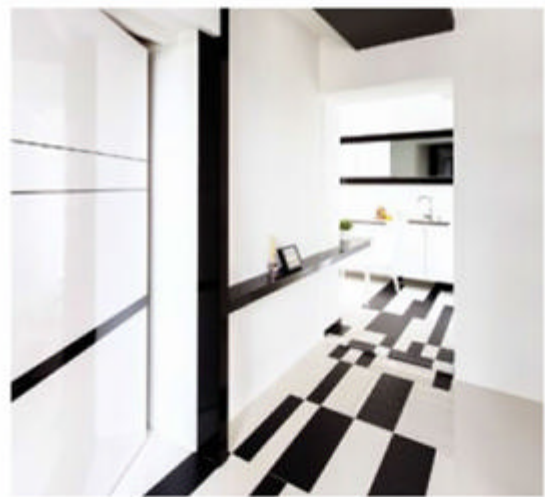


**GOT A TINY KITCHEN?
MAKE IT OPEN-CONCEPT!**

An open-concept layout is your best bet for a tiny kitchen. Stick by these five rules:
www.tinyurl.com/tinykitchenideastory

**7 TRICKS TO MAKE A SMALL ROOM
LOOK BIGGER**

We dish out decor tricks to help you visually enlarge your space. And, no, they don't involve the use of mirrors! More at:
www.tinyurl.com/7decortricks



**5 WAYS TO FEATURE
RAW BRICKS
ON A WALL**

A key design feature of industrial-themed decor, we suggest new ways to include a brick wall in your home: www.tinyurl.com/rawbricksonthewall



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THINK

CONNECTED FOR THE FUTURE

■ In today's world, you can crowdfund and crowdsource an entire industry online; retaining customer loyalty isn't just about who makes the better product, but who builds the most connected ecosystem; and online shopping takes on a new spin with shopping festivals merging individual retailers into a virtual mega mall.

MORE INSIDE >

THE ART OF MOVING

Just how is a smartwatch different from an activity tracker and why can't one device do it all? Daniel Tan, Managing Director, Asia at Jawbone tells us.

BREAKING AWAY FROM THE TREND

Julianne Kost, Principal Digital Imaging Evangelist for Adobe shares her thoughts on selfies and creativity. We also hear she was a hoot to shoot.

THERE'S AN 'UBER' FOR THAT

Smartwatches have been dubbed as the next big thing in technology, but the truth is we have seen very little innovation on that front.

by James Lu



Despite harsh criticism over some of its business practices, app-enabled taxi service, Uber, was recently valued at a staggering US\$40 billion. In fact, Uber's overwhelming success has almost single handedly created an entire new industry model, one where individuals can make their services instantly available to anyone with a smartphone. There's now practically an 'Uber' for everything, from maid services, dog walking, and babysitting to portable ATMs, on-site bicycle repair, and even an Uber-like app for hiring someone's private jet – pilot included of course.

But can these apps repeat Uber's success? Just what makes Uber so successful? If you've ever taken an Uber ride, you'll know that it's generally not cheaper than a regular taxi. But while it may not cost you less money, it is convenient, and in this respect it buys us time and save us effort, the two other costs associated with every transaction. Uber passengers simply tap their smartphone screen and a few minutes later, a taxi magically appears. The app tells you in advance roughly how much the fare will be - so you don't need to worry about shady drivers taking roundabout routes - and all payments are automatically handled through the app so you don't even need to carry cash or a credit card with you. By reducing time and effort costs, Uber is able to deliver better value to the passenger – all without ever actually reducing the price.

"If you've ever taken an Uber ride, you'll know that it's generally not cheaper than a regular taxi. But while it may not cost you less money, it is convenient, and in this respect it buys us time and save us effort, the two other costs associated with every transaction."

But what makes Uber truly successful is how convenient it makes it to be a driver. After all, if Uber couldn't meet demand with enough supply, it wouldn't work. Essentially Uber lets anyone be their own boss, all you need is a car and some spare time. Uber gives its drivers

access to a huge pool of potential customers, the kind of pool that was previously only accessible by working for a larger company. It also handles all core operations like payments and scheduling, letting its drivers sidestep the startup costs that are usually associated with being your own boss. Being an Uber driver is a convenient way to make extra money: there are no sunken costs (assuming you already own a car) and no ongoing costs other than the cost of petrol. Neither the passenger nor the driver pays Uber any subscription fees or other charges. How does Uber make money? It takes a percentage of each fare (around 20 percent depending on the type of car).

When you look at Uber, you shouldn't see it as a taxi app, but a blueprint for how technology can be used to build a business based solely around a core under-exploited

need: convenience. And that's what every Uber-like app is trying to achieve. In the age of Internet and smartphones where instant gratification is everything, convenience, for both customer and supplier is more important than ever.



PICTURES: UBER



LOYALTY THROUGH ECOSYSTEM

Android's diversity is great for users but not for companies looking to retain them.

by Zachary Chan

Apps have since taken center stage in the war of mobile platforms. It's been Apple iOS vs Google Android for a few years now, with other players like Microsoft's renewed Windows Phone creeping up from behind and even the Amazon Appstore, depending on where you live. According to a recent January 2015 report from appFigures.com, a mobile apps reporting platform, Google's Play Store growth in 2014 finally surpassed Apple's App Store. As a platform, that's a win for Android. However, Android hardware manufacturers are still at a disadvantage compared to iOS for the very fact that they are still competing with each other.

So what do you do if you're a hardware manufacturer relying on a largely homogeneous and open operating system? You can start customizing said OS so that on the surface, it looks and feels different from your competitors. For a while, this strategy worked, but after a few generations, mobile devices began to suffer from the same problems notebooks often do: bloatware. Manufacturer programs and features that nobody really needs, forced upon the consumer in the name of uniqueness. At best, they are a distraction you can live with. At worse, they bog down the device, hogging precious resources and storage space.

And like the notebook industry, smartphone manufacturers have realized that simply differentiating themselves—be it through hardware or software—wasn't enough to establish or retain brand loyalty. They were just fueling a culture of one-upmanship where users would just jump from device to device, brand to brand, depending on the flavor of the month.

Just like how Apple or even Microsoft users inherently benefit from their closed ecosystem, Android manufacturers need a similar software ecosystem that isn't just exclusive to their hardware, but also complementary towards user experience.

For starters, they've realized the bloatware problem. And if one were to look at the recent announcements at this year's Mobile World Congress, most manufacturers are starting to trim down their

custom User Interfaces. Samsung's flagship devices were arguably one of the latest offenders when it came to bloatware, but with the Galaxy S6 and S6 Edge, Samsung's TouchWiz interface has become ultra slim, with only three essential tools pre-installed and the rest offered as options only if a user actually chooses to install them.

Now, this still doesn't solve the problem of building loyalty in a sea of Android devices. For that, we chanced upon a meet up with Nicholas Wodtke, Vice President of Samsung's Media Solutions Centre, Southeast Asia and Oceania during the Samsung SEA Forum in February. The Media Solutions Centre works towards creating

products specifically targeted for Samsung users down to geographical preferences, "How Singaporeans consume music is different from how Indonesians or Australians consumer music," explains Wodtke. "We build loyalty for Samsung. We want consumers who have their contracts up, to walk into their telco and already have their mind made up that they are a Samsung user and they want the next Samsung device."

Ultimately, Samsung understands the need to have an inclusive suite of software that works across their products, so you can watch a movie on your phone and have it streamed

to your Samsung TV when you step into the living room. Loyalty and rewards programs such as Galaxy Life are designed to build an inclusive community. Samsung is also working on a gaming platform called Circo, where users earn points playing their favorite games on their Samsung device to redeem for real world benefits. According to Wodtke, Galaxy Life was downloaded 3 million times in 2014, and Samsung saw about 70% returning users, which meant people actually found the rewards enticing enough. This year, Samsung expects a three-fold increase in users, and looking to roll out a new Gold tier VIP treatment for flagship device owners.

Samsung isn't the only manufacturer that has come to realize this. Sony has been evangelizing Remote Play between Playstation and Xperia devices and HTC most recent collaboration with Valve shows there is a clear need for brands to go beyond selling individual devices.

"Android hardware manufacturers are still at a disadvantage over iOS simply because they are competing with one another."



SHOPPING GOES MOBILE

The age of online shopping festivals has begun.

by Marcus Wong

Remember how fighting with the crowds was the only way to get the best bargains at The Great Singapore Sale? Well, those days could well be in the past if online shopping festivals like the recent GOSF (Great Online Shopping Festival) are anything to go by. Organized by Google, DBS and SingPost, the GOSF saw deals from over 60 brands placed on a common platform. With discounts that went up to 90% off on electronics, 80% off on fashion brands, up to 75% off on travel and much more from participating retailers, it's no surprise that the event was well received, with organizers considering it to be a roaring success.

Surprising numbers

What is a surprise though, were the numbers. For the three days of the festival, the gosf.sg portal attracted 800,000 page views from over 400,000 shoppers, with an estimated total of a million page views over both the main GOSF page and the GOSF microsites for the participating retailers.

Shoppers were split evenly across gender, with 49.5% female and 50.5% male, and a good 24% of all shoppers were aged 45 and above, with some 20% of that group aged over 65. This means that close to 20,000 shoppers were what most would consider seniors, showing that online shopping has definitely picked up momentum

"What's also interesting to note, is that a good 58% of the shoppers came to the gosf.sg portal via a mobile device."

amongst all Singaporeans.

What's also interesting to note, is that a good 58% of the shoppers came to the gosf.sg portal via a mobile device, which certainly reflects how we're now becoming so comfortable with being connected via our mobile devices that we're willing to make purchases on it.

Who needs a computer?

Joanna Flint (Country Director, Singapore, Google Asia Pacific) says this is largely because of how smartphones have become "integral" to a Singaporean shopper's life. According to her, a good 48% of Singaporean internet users use their smartphones to conduct product research, and 12% make a purchase on their smartphones weekly.

This is on par with a market like America, and puts us ahead of countries like France (at 3 percent) and Germany (at 8 percent). With smartphone adoption higher than computer

adoption here, Joanna says this is a trend that looks set to continue; as already 16% of users say a smartphone is the only connected device they own!

The world at your fingertips

The other advantage of online sales is that you can literally shop



the world from your mobile phone. Cyber Monday may have started in America, but countries like New Zealand, Argentina and even Japan have instituted their own versions of Cyber Monday in recent years. India was actually the first Asian country to have a Great Online Shopping Festival in 2012, and that ran for just one day. It has since been extended to a stretch of three days (10-12 December) last year, and that experience paved the way for GOSF Singapore.

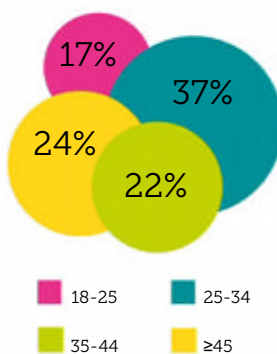
Of course, no discussion about online shopping can be complete without mentioning Alibaba's crazy Single's Day sales. Happening every year on the 11th of November (ie 11/11), the event is responsible for China's biggest e-commerce sales of the year, and is even larger than America's Cyber Monday. 2014's Single's Day festival reached shoppers in more than 200 countries, with total sales figures exceeding 9 billion US dollars!

Shopping in peace

Banks have already started to take notice

BREAK-DOWN OF SHOPPERS FOR GOSF:

Shoppers were evenly split across gender (49.5% F, 50.5% M).



and are moving to capitalize on this trend. Lim Bee Bee, Head of Marketing for Consumer Banking Group (Singapore), DBS Bank says that a 2014 Nielson report places Singapore's smartphone penetration rate at 87%, and already DBS sees that more than 50% of our daily digital transactions are done on a mobile device.

Thus, DBS has launched a mobile wallet app (DBS PayLah!) that allows users to simply select a recipient in their phones' address book, key in an amount and hit send to make funds transfer. They've also implemented a "money-safe" policy where by the bank will reimburse money lost from your account as a result of an unauthorized transaction made from your iBanking account – including mobile banking transactions.

With guarantees such as these, and the obvious advantage of being able to shop wherever and whenever you please, don't be surprised if the next online shopping festival happens really soon, with all the greatest deals appearing right on your mobile device.

WHY THE APPLE WATCH WILL SUCCEED EVEN IF IT ISN'T REVOLUTIONARY

On paper, the Apple Watch certainly sounds like a decent smartwatch, but sometimes, all a product needs to succeed is to look good.

by *Kenny Yeo*



Apple has just released more details about its new Apple Watch, including, most crucially, pricing details. Some have argued that the Apple Watch is a pricey proposition when you consider what it can do. Regardless, the Apple Watch is likely to succeed even if it is pricey and not revolutionary. The reason is because a watch is neither for telling time nor is it a gadget that can receive notifications from your phone. It is also most definitely not an activity-tracking device. The watch is, first and foremost, a fashion accessory. That might sound superficial, but it is very true. If you wear a watch, ask yourself if you chose it solely because of its features or timekeeping abilities. People buy and wear watches because of the way it looks and the way it makes them feel.

How else can you explain folks who splash serious money on luxury timepieces? The US\$15,000 Blancpain Fifty Fathoms is a great diving watch with unparalleled pedigree, but a \$200 G-Shock or Seiko can do the same job. The Rolex GMT-Master II is widely regarded as a top travelers' watch because its jump-hour hand enables wearers to adjust time easily to new timezones, but go anywhere with odd half or 3/4 hour timezones and it will choke. It's much easier to just rely on your smartphone's world-time function.

Function is clearly not one of the things that concerns most watch buyers. Someone might buy a Blancpain Fifty Fathoms because of its diving pedigree, or maybe because they love the domed sapphire bezel, or they simply want a big chunky watch. Likewise, someone might buy a Rolex GMT Master II because of the watch's history and pedigree, or for the simple fact that Rolex, for

"The Apple Watch will sell like hotcakes even if it proves to be no more functional or effective than its rivals."

better or worse, is regarded as a symbol of success.

Therefore, the Apple Watch will sell like hotcakes even if it proves to be no more functional or effective than its rivals. They say beauty is in the eye of the beholder, and indeed, looks are subjective, but build quality is undeniable. And given Apple's track record, their products are generally incredibly well-made. They look and feel like premium items. And this is extremely important for a watch to succeed. And for watch journalists who have handled the Apple

Watch, the consensus is that it exudes a very high level of build quality. Noted watch journalist Benjamin Clymer had this to say about the Apple Watch after spending some time with it at last year's launch event: "The overall level of design in the Apple Watch simply blows away anything – digital or analog – in the watch space at \$350. There is nothing that comes close to the fluidity, attention to detail, or simple build quality found on the Apple Watch in this price bracket." Not

only should Apple's traditional rivals be anxious, watch companies operating in this price bracket should take heed and be worried as well.


Aesthetics and build quality aside, how consumers feel towards a brand plays an important role in the decision-making process. And Apple is very strong in this aspect. Not only does it consistently rank amongst the most recognized and respected brands in the world, it is also one of the top brands when it comes to customer satisfaction.

Expect a mad scramble for the Apple Watch when it finally goes on sale. I would be very surprised if there wasn't.



DQN: A PRECURSOR TO A.I.?

by Salehuddin Husin

 A.I. or Artificial Intelligence is ubiquitous in sci-fi. Cortana from the Halo series of games, HAL 3000 from 2001: A Space Odyssey and J.A.R.V.I.S. from Iron Man all feature self-thinking machines in core roles. While reality still has a long way to go to catch up to sci-fi, Google's DQN algorithm is definitely a step in the right direction. It can't think for itself, but it can learn without external input.

Currently, the algorithm can play a handful of Atari games, in some cases, play them even better than the average player. What's impressive is that the program has no idea what the goal of each game is. It basically has to learn from scratch what it needs to do to get a desirable outcome (in this case a high score), and then take steps to ensure that comes to pass. While it learns and adapts through trial and error, things are a lot more complex under the hood.

DQN uses a complex artificial neural network to do what it does, which isn't all that different from how a human mind works. It may seem a rudimentary thing, but this is just the beginning of Google's foray into artificial intelligence, though the company won't exactly label DQN as an A.I. Instead, Google calls their program an Artificial Agent as they feel true artificial intelligence (or at least a program that can think for itself) is still decades away. DQN is just a small step in a very long journey.



At Jawbone, we focus on three things – beautifully designed hardware, incredible software and cutting-edge data science.



The art of moving

DANIEL TAN
MANAGING
DIRECTOR, ASIA
JAWBONE

by Zachary Chan

The race to put smart devices on the wrist of the consumer is heating up. What is your take on this trend and where does Jawbone plan to take things next?

The market for lifestyle and health wearables is extremely fast-growing. We find that universally people want to live better while that may mean different things to different people. Smart wearable devices, like the UP by Jawbone family, are really giving people that opportunity to learn more about themselves to improve upon that.

Without sharing details on our future roadmap (as we keep this information confidential), you can expect to see four things: 1) The UP platform and hardware continuing to grow globally; 2) Multi-sensor devices that take the sector to another level; 3) The extension of our software platform across many more devices (Apple Health / Android Wear); 4) The explosion of partner platforms as we continue to make the 'Internet of You' a reality.

Do you see a point of convergence between smartwatches, trackers and other wearables, or will they remain separate?

The market is evolving in phases. Phase one was delivering steps and sleep. And getting people used to actually wearing these devices. We are now entering phase two, which is about seeing more data, tracking more, but in a form factor that people will actually wear day and night.

Let's be honest. Nobody is really

delivering on phase two. Most multi-sensor devices are simply too big to be worn 24/7. So we believe a clear dividing line has emerged: on one side are the 'phone on your wrists' wearables – distracting notifications, large, battery-guzzling displays and sensors.

On the other side, we (Jawbone) take a different approach. We create small, fashionable devices not because we want to win awards - it because it is the best way to get someone to wear something day and night. Size does matter.

If a person is serious about total health - they'll wear one of our trackers. If they just want notifications - they'll get a smartwatch. And some people will wear both. The wearable solves different user needs - depending on what the person is most interested in.

Are the sensors we see today as good as they're going to get?

Jawbone is one of the most accurate trackers on the market using sophisticated technology. The UP and UP24 bands and UP Move have an accelerometer in them to observe steps taken. We partnered with FullPower using the MotionX engine, which very accurately interprets that movement from the accelerometer mapped to the biomechanics of human motion to give UP wearers an accurate calculation of steps. And bringing in more signals through multi-sensor devices will allow us to refine accuracy even further.

Here's a common lament about activity trackers. "I'm not an active/sporty person by nature. A fancy bracelet isn't going to suddenly get me to eat or exercise properly." How do you respond to this?

At the end of the day, what people care about is "how does this all affect my life?" The narrative of the UP system is track, understand and act to help people live better. We have helped people live better by combining hardware, software and data.

With the hardware, we have the track part down – that's turnkey with the band being something people actually want to wear to passively track their data. However, tracking by itself is not enough, if you only provide a solution that tracks, people will lose interest over time and become disengaged; this is what we have seen with other products in the market, and this is how the UP system is different.

Our job is to help people make sense of the data – to help them understand it and understand what to do with it. We've had this saying that "Data is good, but understanding is better". What we've been focusing on is how to use UP data to drive understanding, and eventually drive people to act (behavior change). We're the only one doing this – it's what sets us foundationally apart from others in the space.

People love that our Insights help them live better lives, and the hardware that collects this data has to be equally beautiful and integrated into their lives.

Breaking away from the trend

JULIEANNE KOST
PRINCIPAL DIGITAL IMAGING EVANGELIST,
ADOBE PHOTOSHOP AND LIGHTROOM, ADOBE
SYSTEMS, INC

by *Kenny Yeo*

For beginners, what's the difference between Photoshop and Lightroom?

I feel that if I was a beginner, I would start with Lightroom. The reason I say that is because it was designed specifically for photographers. So when you open up Lightroom and you start importing your images, right away it's modular-based and you can put images in a folder, you can make separate collections, rate them, organize them, and pick the best one and then go over and make that image look great. So Lightroom perhaps works more in the way of the traditional manner of what we would think about with photography, where I have taken a photograph and I want to make that photograph look gorgeous. You could also output the file, so you can print it, make a slideshow, a web gallery or make an entire book in Lightroom. So Lightroom will really take a good number of photographers from start to finish.

It's only for photographers like me who want to do a lot more than that. I want to take multiple images and put them together; I want to add a texture to enhance the mood of a photograph; I want to add multiple layers with maybe some kind of distortion; I want to create my own world from multiple images; that's what Photoshop is really good at.

Would you say that it's more important for beginners to invest in Lightroom first?

I think so. It is going to be easier. They are going to get up to speed on all the big concepts. And it is not as overwhelming. And as soon as they want to take their photography and do more, they can do it with Photoshop.

I'm going to pick the Adjustment Brush in Lightroom in the Develop Module or in Adobe Camera Raw. The Adjustment Brush allows you to paint in effects in different areas of your photograph and it can be extremely useful to help the photographer guide the viewers' eye around the image.

So it can help bring things and make them brighter and forward in the image, or darken down areas that are less important and hide them, it can remove distracting elements. For example, if you got a portrait, you want to be looking at the person's face, and if there's something else that is distracting like bright earrings, you can dim them down. You can make them a little bit darker or you can make them a little less sharp and you can leave the viewer's eyes to the face.

And I think a lot of people tend to want to make one movement with a slider in Lightroom or in Photoshop and adjust the whole image, whereas there's really an art and a craft that comes in the post-processing where you really are manipulating the image, and pushing and pulling different areas to really narrow the focus or the view of the person that is looking at the image.

What's your take on the current craze on selfies?

The whole craze today with selfies, with cellphones, with all this mobile posting with social media is just another way of visually communicating. Think about how fortunate we are that instead of sitting down and write, you can just take a photograph and I understand that photo, you understand that photograph, and anyone who speaks

any language can understand that photo when they look at it, even if they might interpret a little differently because everyone brings their own world experiences to an image, but what a great way to communicate with people.

How can photographers find ways to exercise and practice creativity? Is it even possible?

I did a project for three years where I posted three images a day wherever I was, because I found that I wasn't carrying my DSLR so I needed to exercise. I needed to exercise this creative muscle. I needed to exercise my eye. I needed to exercise compositionally every day. So I started getting out my camera phone and taking these pictures every day. I decided on three pictures and they have to be the same subject. So I could take a picture of the chair, but then I need two more pictures of that chair to stretch your imagination. I was trying to make a deeper image and not just take that first shot that I saw. After the end of each year I would look at the photos and I saw relationships between different places and how I was feeling and events in my life. And just as a self-awareness process, I think I would encourage anyone to do that. To have a personal project that they are constantly photographing or doing whatever it is that they love to do, because I think that on a daily basis we can get overwhelmed with work and it's really hard to make time. Because you don't just find time you have to make time to be creative. And then stick to it, put it out on social media and commit to it and see if your community will support whatever it is you are trying to do.

“

I needed to exercise this creative muscle. I needed to exercise my eye. I needed to exercise compositionally every day.

”

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FEATURE

MWC 2015

What will they think of next? That's often the biggest question when it comes to smartphone innovation. Here are the top trends and highlights from Barcelona you can look forward to.

Text by **Team HWM** Illustration **Ven** Art Direction **Ken Koh**

Order restored in the galaxy

The Galaxy S6 marks the start of a new Samsung Mobile.

By Ng Chong Seng

P

lastic. It's a word long associated with Samsung's mobile devices, especially its Galaxy series of smartphones. I don't know if Samsung has given a bad name to it, or the other way round, but it's hard to argue against the many good properties of this synthetic material.

For one, plastic is easier and cheaper to work with, which explains its widespread use in hardware products across industries. And while it's not impervious to scratches, they usually aren't very noticeable. Of course, when dropped or subjected to stress, plastic is less likely to dent or bend as much as metal.



What's wrong with plastic is that it doesn't feel premium. Regardless of treatment, it'll never, ever feel as good as a solid block of steel or aluminum. But the worst part is when the finishing can't withstand the test of time. I used to own a Galaxy S4 that had a plastic frame with a metallic-looking chrome finish. The paint started flaking six months in. Remember, this was a \$900 flagship phone (at the time) I'm talking about here. It's unacceptable.

But it's not as if Samsung isn't aware of what people are complaining about. For a while now, the Korean company has promised big design changes for its phones. We saw hints of that in the Galaxy Alpha, Note 4, and Note Edge with their metal frames; and more recently, the midrange Galaxy A series phones with their full-metal design. But these seemed like half-hearted experiments, quick dips of the toe in the water if you will.

THE GALAXY S6, ANNOUNCED AND SHOWN OFF DURING MOBILE WORLD CONGRESS, IS UNDOUBTEDLY THE NICEST-LOOKING AND FEELING PHONE SAMSUNG'S MOBILE DIVISION HAS CHURNED OUT TO DATE.

The Galaxy S6, announced and shown off during Mobile World Congress in Barcelona this past March, however, is different. Codenamed 'Project Zero', this is undoubtedly the nicest-looking and feeling phone Samsung's mobile division has churned out to date (shocking, I know). There's a metal frame, made of a harder alloy so that it's less likely to bend; Corning's Gorilla Glass 4 at the front protecting the 5.1-inch, Quad HD (2,560 x 1,440 pixels) Super AMOLED display; and the same Gorilla Glass at the back.

Remarkable restraint

Sure, the Galaxy S6's glass back may well be

a deliberate move to stem the copycat talk (recent HTC Ones and iPhones are known for their metal unibody designs) - but that's really besides the point. The most important thing is these glass covers don't feel cheap at all. In fact, Samsung has rather cleverly worked it to its advantage. Through the use of a new type of colored finish under the glass, the S6 is offered in an array of "jewel tones". Yes, that's marketing speak, but it's also quite an apt description. Due to the way light is reflected, each color looks and sparkles a bit differently at different angles - you know, just like a jewel.

Reducing "feature spam" is another piece of advice Samsung has taken to heart, and this continues on the Galaxy S6. It's now hard even for critics to pick out a new feature and call it superfluous. The double-tap-home-screen-button-anywhere to open the Camera app; the improved front and rear cameras (16 and 5 megapixels

respectively); the faster AF tracking; the built-in wireless charging that rids the need to buy a separate cover - these are all solid improvements, features that benefit more than just a handful of users.

Samsung also shows remarkable restraint with the

Galaxy S6 Edge, which is mostly an S6 with curved left and right edges. The Samsung of old would have devised many over-the-top ways to make use of the curved strips, but not this time. The two main uses of the sloping edges - Information Stream, which displays things like weather, time, and notifications; and People Edge, which lets you use either side of the strips to quickly access calls, text messages, email, and frequent contacts - once again make tremendous sense.

There's also something I didn't envision myself saying a couple of years ago: TouchWiz, Samsung's user interface that sits atop Android, is finally responsive. Gone are

Microsoft (apps) everywhere

With less than 4% market share, Microsoft's Windows Phone hasn't quite gone everywhere. And at MWC, the Lumia 640 and Lumia 640 XL are hardly the kind of hardware that will set your heart racing. I can only posit that the Redmond-based company is saving the ammunition for the end of the year to coincide with the launch of Windows 10.

On the other hand, Microsoft's software and services are going places. In the past 12 months, it has brought Office to the iPad, extended it to Dropbox, and acquired third-party apps like Acomplia and Sunrise supplement its Android and iOS offerings. And just last month, a preview version of Office 2016 for Mac has dropped for long-suffering Office for Mac 2011 users.

Microsoft is also open to partner with competitors. On the new Samsung Galaxy S6 and S6 Edge for example, there's a Microsoft Apps folder that's home to apps like OneDrive, OneNote, and Skype. This partnership also sees Samsung ending its deal with Dropbox. Instead of free Dropbox cloud storage, the new phones will come with free 100GB of OneDrive storage for two years.

most of the bloatware and S-branded apps, save for the truly useful ones like S Health, S Planner, and S Finder. UI navigation is less intimidating and more straightforward too, thanks to the reduction of settings in menus and the replacement of obscure icons with text. Coupled with generational hardware improvements like the crazy-fast Exynos 7420 processor and 3GB of LPDDR4 RAM, even the slightest of micro stutters are gone.

All that said, there's no guarantee that the Galaxy S6 and S6 Edge will be a success, and they come at a time where the company is experiencing declining mobile profits. So far, Samsung has been making all the right moves; let's see how the consumers react when the phones go on sale on April 10.



Resisting the commoditization of smartphones

How mobile brands like HTC are trying to keep things fresh.

By Jimmy Tang



The smartphone business is no longer the same as before as the average selling price of devices continue to fall and feature sets becoming increasingly similar. Manufacturers are all adopting standard specifications either dictated by the chipsets offered by low cost SoC vendors or standard parts that provide OEMs with better cost advantage. No matter how you look at it, there's little differentiation remaining in today's mainstream and budget devices. At the end of the day, the focus is really on price.

But some manufacturers are not interested in racing to the bottom with brands that focuses only on budget smartphones. They know all too well that once they start to descend and compete in that market segment, it'll be a continual downward spiral towards the commoditization of smartphones.

Smartphone manufacturers like Samsung recently noted that although market competition is stiff, it would continue to offer premium products with the use of higher quality materials, thinner unique designs and exceptional hardware like higher resolution displays across its portfolio of products.

HTC, on the other hand, believes that there are still a lot of room left for unique differentiation and firmly thinks that the commoditization of smartphones would not happen anytime soon. Noting how smartphones are highly personal devices, HTC doesn't think that consumers would settle for generic looking products.

The recent launch of the Samsung Galaxy S6 and HTC One (M9) demonstrated how both companies are trying to set themselves apart from their competitors with more premium specifications and greater luxurious feel to the smartphone's build. While Samsung has finally replaced its cheap plastic finish in its flagship series with glass, HTC kept their design DNA and improved on its aluminum finishing. Although both companies have a very different

approach to their design, they have one thing in common - design and product personalization ranked high on their list of priorities.

Still, smartphone manufacturers are not resting on their laurels. Pressured by dwindling sales and lowered profit margins, manufacturers are now looking beyond smartphones for the next source of revenue. Popular brands like Samsung, LG and Sony have already started venturing into the smartwatch space while Apple has only just released the Apple Watch last month. However, that's not the only trend that these companies are betting on.

Beyond smartwatches and fitness bands, manufacturers are now eyeing the lucrative yet untapped market for VR headsets. Samsung is already on their second iteration of the Samsung Gear VR that works only with the Samsung Galaxy S6 while HTC announced the HTC Vive, a new VR headset targeted specifically at gamers. One thing in common with these two company's strategy is that they are not going into this alone. Samsung is building its Gear VR headset in collaboration with Oculus VR while HTC is partnering with Valve. The approach is not surprising because both technology partners have the technical know-how and content to support the

products while it's obvious that Samsung and HTC are only playing the role of a hardware developer and manufacturer. Still, it's not an uncommon partnership given how Android smartphones heavily depend on Google for its software and apps ecosystem.

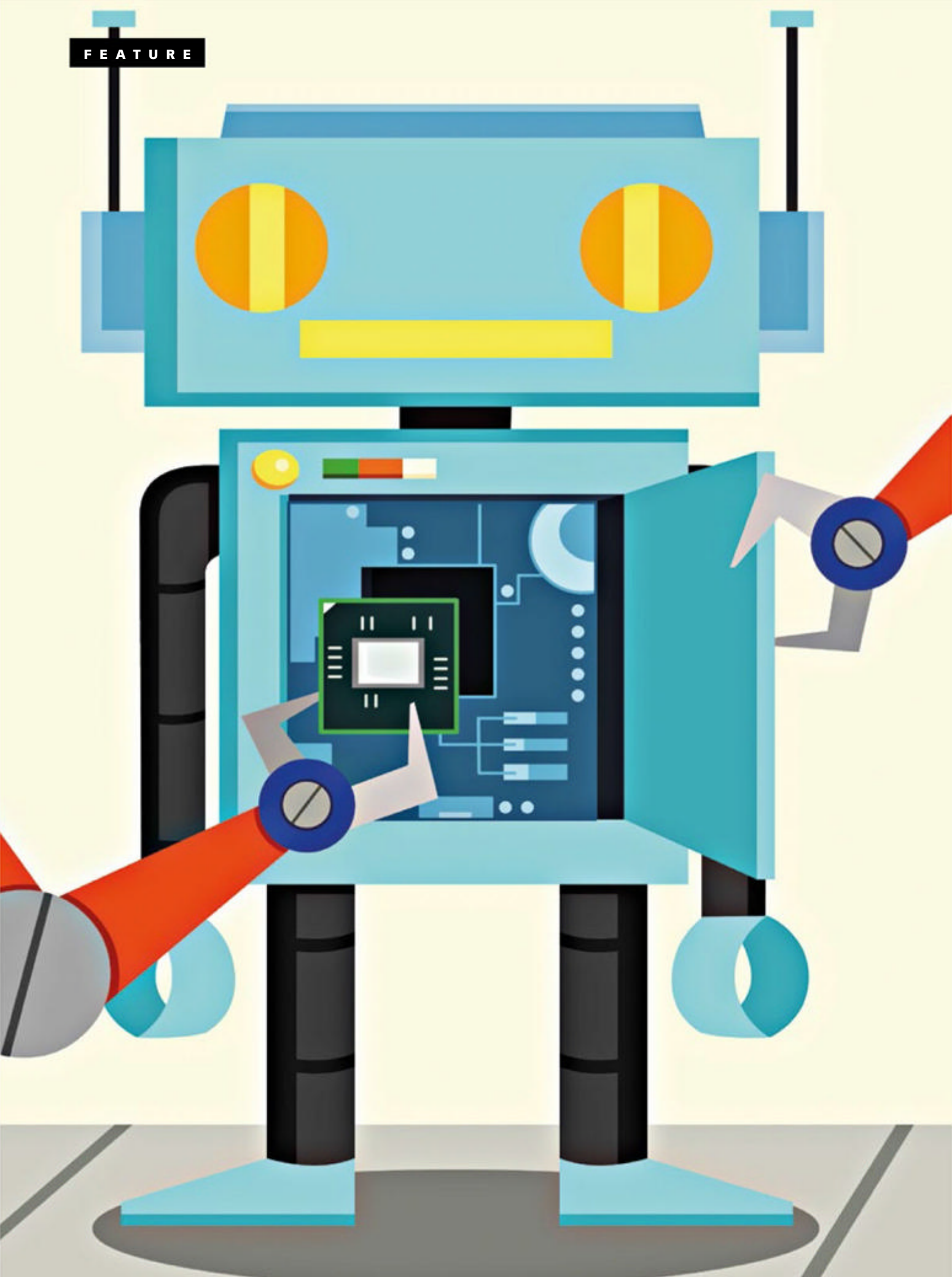
Besides Samsung and HTC, Sony is also investing in the VR market with Project Morpheus. Announced early last year, the product has been work-in-progress with a launch date set somewhere in 2016. It's not clear if the product is going to be extended beyond gaming on the PS4 but unlike Samsung and HTC, Sony is entering the VR market by itself.

There seems to be no lack of opportunities and product diversification seems to be the main strategy for smartphone manufacturers to remain relevant in this competitive marketplace.

HTC BELIEVES THAT THERE ARE STILL A LOT OF ROOM LEFT FOR UNIQUE DIFFERENTIATION AND FIRMLY THINKS THAT THE COMMODITIZATION OF SMARTPHONES WOULD NOT HAPPEN ANYTIME SOON.



FEATURE



In the near future, smartphones may work like your brain

"Qualcomm's Deep Learning mobile platform that will change everything about how your phone interacts with you."

By James Lu

M

For several years now, chip-maker Qualcomm and Brain Corp, a separate company that it has invested in, have been working on a combined hardware

and software platform that attempts to mimic the processes of the human brain. They call the platform, 'Zeroth'.

The goal of Zeroth is for it to do more than just perform pre-programmed tasks. It will also be able to learn and adapt accordingly. The technology driving Zeroth is based on a family of algorithms called Deep Learning, which has also been used by Google subsidiary DeepMind to program a computer to play Atari video games at a superhuman level. Deep Learning software is loosely modelled on the way the human brain works: it can be trained to recognize certain objects in images by processing many example photos through a network of artificial 'neurons' arranged into hierarchical layers. In other words, it recognizes images by comparing them to other images in its memory, similar to the way you can identify objects, even if you've never seen that same exact object before, based on your own past experiences.

At MWC 2015 last month, Qualcomm showed off the first working prototype of Zeroth. When integrated into a smartphone, it demonstrated how Zeroth could improve a smartphone's camera app by being able to successfully recognize individual elements of what you're taking a picture of, such as food, a city skyline or a group of friends, even if it had no prior experience with the actual subject matter you're shooting. The app would then automatically adjust the camera settings to ensure you take the best possible picture. The app was even capable of live tagging the names of your friends in real time by referencing previous photos you've taken of them.

Qualcomm also said that, as well as processing images, the Zeroth software

could allow phones to recognize speech or other sounds, and to learn to spot patterns of activity from a device's sensors. Computing at this level, which requires more than just simple task operations, generally requires Cloud Computing to accomplish, but Qualcomm says that all such computation will be performed on the phone itself. By keeping all operations at a local level, not only will Zeroth remove the requirement of internet connectivity, it will also enable faster feedback and action to be taken from data received from the device's sensors. Qualcomm has suggested that one of the first practical applications of Zeroth's predictive learning skills will be extending device battery life by tracking the way a

person uses their phone and learning when it can safely power down to save energy without affecting the user experience.

The Zeroth software is being developed to launch with Qualcomm's Snapdragon 820 system-on-a-chip, which will enter production later this year, meaning it should be available in consumer devices in early 2016. Qualcomm has also announced that as well as smartphone manufacturers, the Snapdragon 820 and the Zeroth software will be aimed at manufacturers of artificial intelligence drones and robots. Hopefully, the platform lives up to its name - it's taken from science fiction author Isaac Asimov's 'Zeroth Law of Robotics': "Robots must not harm humanity." **HMM**



STARTING THEM YOUNG

by Salehuddin Husin

If you have a kid (or baby), as a tech savvy parent, you owe it to them to expose them to as much tech as possible so they can easily assimilate, gain an advantage and all that jazz. Ah who are we kidding? You just want to make life easier on yourself. Don't worry, we won't judge. Even better, we know your pain and we come bearing gifts for new parents as well as parents with older kids.



BABYGIGL

WWW.SLOWCONTROL.COM

The BabyGigl is the next evolution in baby bottles, meaning it's smart enough to know if you're being a good parent. Actually, it's not a bottle. It's a plastic sleeve that you plug a bottle into, which will then give you feedback on how fast your baby is drinking, how to hold the bottle and if there's something clogging it up. There's even an included app (Android & iOS) that shows when your baby's last meal was, how much was consumed and how long it took, which is useful if you're remotely monitoring your baby.



HEREO

WWW.HEREOFAMILY.COM

The hereO (we're not sure how to pronounce it either) is a GPS smartwatch for kids so parents can monitor where their child at all times. Using the free app (iOS and Android, with Blackberry and Windows support soon), parents can program safe zones, with alerts when the kid arrives or departs from that location. There's also a function called PanicAlert, which will alert all family members if it's triggered by the child. Perhaps the most useful feature is the directional guidance which can direct the child to the nearest family member.



PAXIE BAND

WWW.OURSAFEFAMILY.COM

While the hereO is a watch on top of the things it does, the PAXIE is more of an activity tracker band with interchangeable designs that your kid wears. It actually has some unique features that set it apart from the hereO, such as tracking heart rate, daily activity, and temperature monitoring and removal alarms. It also has boundary settings and location tagging capabilities, similar to the hereO. Also like the hereO, the PAXIE band requires a subscription, though the PAXIE's monthly subscription rate is still unannounced.



■
UBOOLY

WWW.UBOOLY.COM

To say that we've never seen a toy like this is an understatement. It's a smart plush casing which you can insert a smart phone or tablet into. You then run the app and it'll turn your device into an Ubooly which is able to interact with your kid. Ubooly has speech recognition and will adapt to your kid as they interact with the toy. There are also a ton of other activities that the Ubooly can do, with more being constantly added by the manufacturer as the app gets updated.



■
VTECH KIDIZOOM SMARTWATCH
WWW.VTECHKIDS.COM

The Kidizoom Smartwatch might just be the greatest smartwatch ever. It can record sounds and voices, take pictures and videos and has the ability to play games. It's pretty much what every smartwatch (for kids and adults) should aim for when they're looking for a smart device. It also comes in a variety of colors and you can connect it via USB to transfer the videos and photos. The rechargeable battery also reputedly lasts for two weeks on a single charge so you don't need to constantly have it plugged in. Now don't you wish the Apple Watch does everything the Kidizoom does?

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LAB RESULTS

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MORE INSIDE >

CASIO ZR3500
Have wifie will travel.

SONY
SMARTWATCH 3
Built for runners.

CANON
MAXIFY MB5370
Waterproof printing.

LG G FLEX2
Of course it bends.

HOW WE RATE:

Products are rated on a scale of **1** to **10**; **1** being so abysmal, it should be a crime to sell it, and **10** being almost perfect. Come now, nothing is perfect. An Editor's Choice may also be awarded based on unique merits.



TRANSFORMING FOR THE FUTURE

Portable computing today can be a complicated lot what with smartphones and tablets and notebooks all vying for your attention. If you don't want to be carrying so many devices though, a convertible may be just what the doctor ordered. Here are four machines to consider.

Text by *Salehuddin Husin*
Photography by *Zaphs Zhang*
Art Direction by *Ian Chong*



VS

ACER ASPIRE R13

•

ASUS TRANSFORMER
BOOK FLIP TP300L

•

DELL INSPIRON 13 7000

•

LENOVO YOGA 3 PRO



ACER ASPIRE R13

There's a lot to like about Acer's Aspire R13. It's one of the lighter notebooks (second only to the Lenovo Yoga 3 Pro) and it's also packing some significant hardware inside. It has a Full HD display and a speedy processor in the Intel Core i7-4510U. What really sets it apart from the competition isn't the fact that it uses SSD storage, but the fact that it combines two 256GB ones in a RAID 0 config for blazingly fast performance.

The other factor that makes the Aspire R13 such an attractive choice lies in the hinged display. It uses a special hinge that Acer calls the Ezel Aero Hinge and you can adjust it however you like to get the optimal view angle you want with little effort. There are even magnets embedded in the display that keeps it locked in place whenever it's back to a traditional laptop style.

It's a little wider than the others due to the hinges on either side, but even then the addition is barely noticeable. The chassis's solid enough, even with all the twisting and turning you'll be putting the machine

through. The base holds all the ports on the machine, with the USB 3.0 ports on one side (accompanied by a HDMI and audio jack) and the SD card reader, power input and a lone USB 2.0 on the other.

The machine has a full length keyboard, but due to needing to squeeze everything in to that space, the keys are squashed together. The arrows keys are so close together it's almost impossible to tell them apart using touch alone. Under that is the touchpad, though thankfully not a squashed version of one. Like all the other notebooks in the shootout, there aren't any physical buttons on the touchpad, which might turn some people off.

After putting it through our usual benchmarks, we found that it performed remarkably well though there are some issues regarding its battery life that we weren't too pleased about. All in all, the Acer Aspire R13 is a solid choice for a convertible notebook with decent performance and copious amounts of storage.



Hinged display lets you pick any angle you want. Quality hardware.



Pricey. Shallow keyboard.



AT A GLANCE

Display

13.3 inch 1,920 x 1,080 IPS touchscreen

Processor

Intel Core i7-4510U (2.0GHz)

Storage

2 x 256GB (RAID 0)

Weight

1.5kg

Price

\$2,298



You can pretty much guarantee that you'll find the perfect viewing angle with the hinged display.



The power button's out of the way so you won't accidentally hit it.



Corning Gorilla glass ensures that it doesn't crack easily.

ASUS TRANSFORMER BOOK FLIP TP300L

The ASUS Transformer Book Flip TP300L looks pretty good on paper for two main reasons. One, it's one of the few convertibles (and the only one in this shootout) that has its own graphics card. Granted, the NVIDIA GeForce GTX 820M it carries is nothing to write home about but it's still better than the integrated graphics found on the other notebooks. Second, it's insanely cheap. Getting a proper 2-in-1 machine for just over \$1,000 is a pretty good deal. Of course, you expect trade offs.

While the TP300L can claim to perform better in anything that requires a graphics card, it falls short at generic computing like Office or Adobe applications.

It's also the heaviest machine in the shootout as well as, to put it lightly, bland. We normally don't judge machines based on looks alone, and some gaming notebooks for example are huge and garish. However, a convertible that is meant to be used as a tablet does tend to require some elegance.

The TP300L is a boxy and thick piece of hardware in a field filled with sleek and sexy machines. When you take that and couple it with its basic resolution display, the only notebook here that's still using a 1,366 x 768 pixel resolution panel, you've got a truly entry-level machine.

Look past the hardware deficiencies and you'll find that the notebook is like most others. It has the de rigueur ports (2 x USB 3.0, 1 x USB 2.0, 1 x HDMI, SD card slot, audio jack and power adapter port) scattered throughout its sides, as well as volume control buttons and a Windows shortcut key set into the left side. The keyboard's as squashed as the others though there's really not much to be done there due to

the small space.

One silver lining to be found is that the machine's one of the longer lasting ones in this shootout. It might be a small consolation, but it lasted more than 4 hours, a feat only surpassed by the Yoga 3 Pro. But is that good enough with all its other drawbacks? Perhaps not.



**Discrete graphics.
Affordable.**



**Performance issues.
Blocky and heavy.
Display resolution.**



AT A GLANCE

Display

13.3 inch 1,366 x 768
LED touchscreen

Processor

Intel Core i5-4210U
(1.70GHz)

Storage

500GB HDD

Weight

1.75kg

Price

\$1,098



The volume buttons are a bit too near the power button which could lead to accidents.



The notebook is the only one in the shootout that has discrete graphics.



The Windows button is located at the side.

DELL INSPIRON 13 7000

We're not joking when we say the performance of the Dell Inspiron 13 7000 is average. It always manages to rank second or third in every benchmark we put it through, never first and only once last (in the battery life benchmark). Even the pricing and its weight put it squarely in the middle of the pack. Its average nature extends to every facet of the machine; there truly is nothing remarkable about it. On the other hand, there really isn't anything glaringly bad about it as well.

Physically, we like the curved theme the convertible has got going for it. To be fair, all the other notebooks also have rounded edges but there's just something about the Dell Inspiron 13 7000 that calls out to us to touch it. The chassis itself is made up of plastic but it has a weird rubbery texture to it that we've never felt before. It's not unpleasant, in fact, it grips pretty well.

There are some design issues regarding the display though. If you put it in tablet mode, the display doesn't stick to the chassis. The

other notebooks all use magnets to keep the display in place in tablet mode but the Dell Inspiron 13 has nothing. It's a bit too easy to lift up the display when in tablet mode.

One thing the machine has that no other notebook in our shootout does is a stylus. It might be weird to think that a notebook needs a stylus, but remember this is a convertible. When in tablet form, the added precision input means tasks like visual design or taking down notes are easily accomplished.

Similar to the other machines, the Dell Inspiron 13's keyboard is pretty much the length of a basic TKL keyboard. It's a bit cramped and the lack of depth to the keys didn't really sit that well with us. To be fair, this is a

criticism we have of many notebooks, not just convertible ones.

There's really not much else to be said about the convertible. Like we mentioned, it truly is average. If you're on a budget though, then you can't do better (or worse) than the Dell Inspiron 13 7000 for its asking price.


Stylus. Nice aesthetics.


Average in every aspect. Battery life.



AT A GLANCE

Display

13.3 inch 1,920 x 1,080 IPS touchscreen

Processor

Intel Core i5-4210U (1.70GHz)

Storage

500GB HDD

Weight

1.66kg

Price

\$1,399



The Dell notebook has its speakers on its sides.



The Windows button is located in the middle of the monitor.



The Dell Inspiron 13 is the only notebook in the shootout with a stylus.

LENOVO YOGA 3 PRO

The Lenovo Yoga 3 Pro is the only notebook in the shootout with the new Intel Core M processor. It's not as fast as the others though it brings other benefits, namely that it allows the notebook to be extremely thin as well as a longer lasting battery. Despite Lenovo's claims that it can last about 7 hours though, ours clocked in at just 4 hours and 25 minutes. Still, this was already longer lasting than the other machines.

There's a lot to like about Lenovo's flagship Yoga machine. It's the only other machine (apart from Acer's) to have SSD storage. While it might not be as spacious (there is a 512GB version for \$2,599), it's sufficient for basic storage. It is also the only notebook to offer a very high resolution display at 3,200 x 1,800 pixels. The machine looks really nice and the rubberized finish on the base feels great while typing.

Speaking of, that's one of our main issues with the machine. We've already said how much we don't like shallow keyboards. Meet the worst of the bunch. The Yoga 3 Pro is so thin that you can literally feel the flex and

vibrations as you type away on the keyboard.

Like the other notebooks, the Yoga 3 Pro has most of the same ports. There's the requisite USB 3.0 ports (two of them), SD card slot and audio jack but the machine also has its share of unique ports not found on the others. For one, the single USB 2.0 port also doubles as the charging port. There's also a micro HDMI port instead of the normal sized ones found on the others.

The new stuff isn't just in its electronic components. Lenovo's redesigned the regular hinges and they've come up with what they dub the 'watchband' hinge, which look like links on a watch strap. These hinges are supposed to be stronger and more durable than regular ones.

All this tech and bling makes the Yoga 3 Pro one of the most expensive convertibles out there, and it is aesthetically the most pleasing to look at. However, for the asking price, the tradeoffs (chief among them being the sluggish processor) might be too much for some users to bear.


**Weight. Battery. Size.
Aesthetics.**


**Shallow keyboard.
Pricey.**



AT A GLANCE

Display

13.3 inch 3,200 x 1,800
IPS touchscreen

Processor

Intel Core M-5Y70
(1.1GHz)

Storage

256GB HDD

Weight

1.19kg

Price

\$2,290



The Yoga 3 Pro is the thinnest of all the notebooks in the shootout.



The Yoga 3 Pro has a custom port that can be used for the charger or as a USB 2.0 port.



The hinges are watch-like, which Lenovo claims are more durable than regular ones.

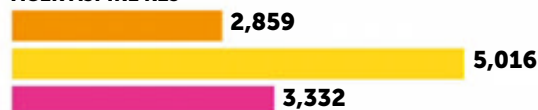
PC Mark 8

(higher is better)

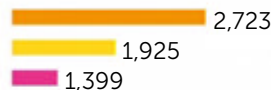
PC Mark 8 tests many different aspects of a machine's hardware, simulating typical situations. Home simulates a typical computer usage at home while creative focuses more on multimedia and other demanding tasks while Work tests basic office work task. In almost every category, we see the Acer Aspire R13 leading the pack.

- PCMark 8 - Work
- PCMark 8 - Storage
- PCMark 8 - Adobe

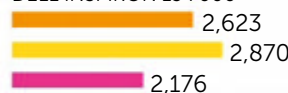
ACER ASPIRE R13



ASUS TRANSFORMER BOOK FLIP TP300L



DELL INSPIRON 13 7000



LENOVO YOGA 3 PRO



3D Mark 2013

(higher is better)

3D Mark is more intensive test of a machine's graphical processing capabilities. It's mainly used to test mainstream machines like desktops or notebooks, with even more demanding tasks present to test high end machines. Cloud Gate tests processing power as much as graphical capabilities, which is why the Acer Aspire R13 leads the back despite having no discrete graphics. On the other hand, Fire Strike requires graphical processing muscle to score well, which is why the NVIDIA GeForce GTX 820M present in the ASUS Transformer Book Flip gave it the edge over everything else.

- Cloud Gate
- Fire Strike

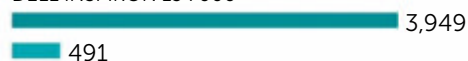
ACER ASPIRE R13



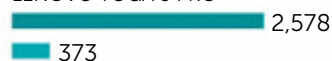
ASUS TRANSFORMER BOOK FLIP TP300L



DELL INSPIRON 13 7000



LENOVO YOGA 3 PRO



Battery Life

(higher is better)

We tested each notebook's battery life using the built in battery life benchmark in PC Mark 8. It's not surprising that the Lenovo Yoga 3 Pro lasts the longest as it uses the new Intel Core M processor inside. The only reason for the ASUS Transformer Book Flip posting such a high score can easily be attributed to its low power consumption. Despite having a 73Wh battery capacity (the smallest of all the convertibles compared here), its low power consumption carried it further than most of the pack.

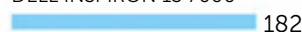
ACER ASPIRE R13



ASUS TRANSFORMER BOOK FLIP TP300L



DELL INSPIRON 13 7000



LENOVO YOGA 3 PRO





MODEL	ACER ASPIRE R13	ASUS TRANSFORMER BOOK FLIP TP300L	DELL INSPIRON 13 7000	LENOVO YOGA 3 PRO
DISPLAY	13.3 inch 1920 x 1080 IPS Touchscreen	13.3 inch 1366 x 768 LED Touchscreen	13.3 inch 1920 x 1080 IPS Touchscreen	13.3 inch 3200 x 1800 IPS Touchscreen
PROCESSOR	Intel Core i7-4510U (2GHz)	Intel Core i5-4210U (1.70GHz)	Intel Core i5-4210U (1.70GHz)	Intel Core M-5Y70 (1.1GHz)
RAM	8GB	4GB	8GB	8GB
STORAGE	512GB (SSD)	500GB (HDD)	500GB (HDD)	256GB (SSD)
CONNECTIVITY	Intel Dual Band Wireless AC, Bluetooth 4.0	Intel Dual Band Wireless AC, Bluetooth 4.0	Dell Wireless 1708, Bluetooth 4.0	Intel Dual Band Wireless AC, Bluetooth 4.0
PORTS	2 x USB 3.0 1 x USB 2.0 1 x HDMI 1 x Audio Jack (Mic + Headphone) 1 x DC port 1 x SD Card reader	2 x USB 3.0 1 x USB 2.0 1 x HDMI 1 x Audio Jack (Mic + Headphone) 1 x DC port 1 x SD Card reader	2 x USB 3.0 1 x USB 2.0 1 x Security Slot 1 x HDMI 1 x Audio Jack (Mic + Headphone) 1 x DC port 1 x SD Card reader	2 x USB 3.0 1 x Micro HDMI 1 x Audio Jack (Mic + Headphone) 1 x DC port 1 x SD Card reader
DIMENSIONS	343 x 231 x 18mm	326 x 232 x 22mm	330 x 222 x 19.4mm	330 x 228 x 12.8mm
WEIGHT	1.5kg	1.75kg	1.66kg	1.19kg
PRICE	\$2,298	\$1,098	\$1,399	\$2,299

INTEL CORE M

The Intel Core M is part of the newest generation of chipsets that Intel is pushing for use in 2-in-1s, tablets and notebooks. Codenamed Broadwell, it is the fifth generation of Intel's current microarchitecture line. The main feature of the Intel Core M is its vastly reduced size (14nm from 22nm), thus allowing the creation of slimmer machines due to the possibilities of fan-less design implementation while also improving power consumption so devices last longer. Broadwell-based notebooks should be hitting the shelves by the time you read this, and will be succeeded by Skylake towards the end of the year.



THE BEST 2 IN 1 CONVERTIBLE IS



ACER ASPIRE R13

On paper, the Lenovo Yoga 3 Pro looks like the better machine since it's the only one in this shootout to feature the latest Intel Core M and the best screen. Sadly, they were designed for greater endurance at the cost of performance, and when we looked at our benchmarks and considered the price point, the Acer Aspire R13 clearly offered the best value. But both the ASUS and Dell cost \$1,000 less you say. True, and they do offer good bang-for-buck. However, if you're opting for a convertible, you're looking to satisfy a dual purpose. And that means a machine that'll perform like a proper notebook when you need it to, not just a tablet with a keyboard. The Acer Aspire R13 again fits this bill. It comes with a speedy and spacious SSD, manageable weight, plus the best performance of the lot. Couple that with its highly versatile hinge, the choice becomes easier.



ONE FM's
#2 BREAKFAST SHOW
WITH
PART-TIME PETE
& ANDRE HOEDEN
WEEKDAYS 6:00 AM - 10:00 AM



NO REPEAT
WORKDAY
WITH
DESIREE
WEEKDAYS
10:00 AM - 1:00 PM




NO REPEAT
WORKDAY
WITH
MELODY
WEEKDAYS
1:00 PM - 4:00 PM

THE
ESCAPE PLAN
WITH
SHAN & CHERYL
WEEKDAYS
4:00 PM - 8:00 PM






THE ONE FM
REALITY CHECK
WITH
JOSH & JILL
WEEKDAYS
8:00 PM - 12:00 MN



WEEKENDS
WITH
HARRY
12:00 PM - 6:00 PM

SOUND SELECTIONS

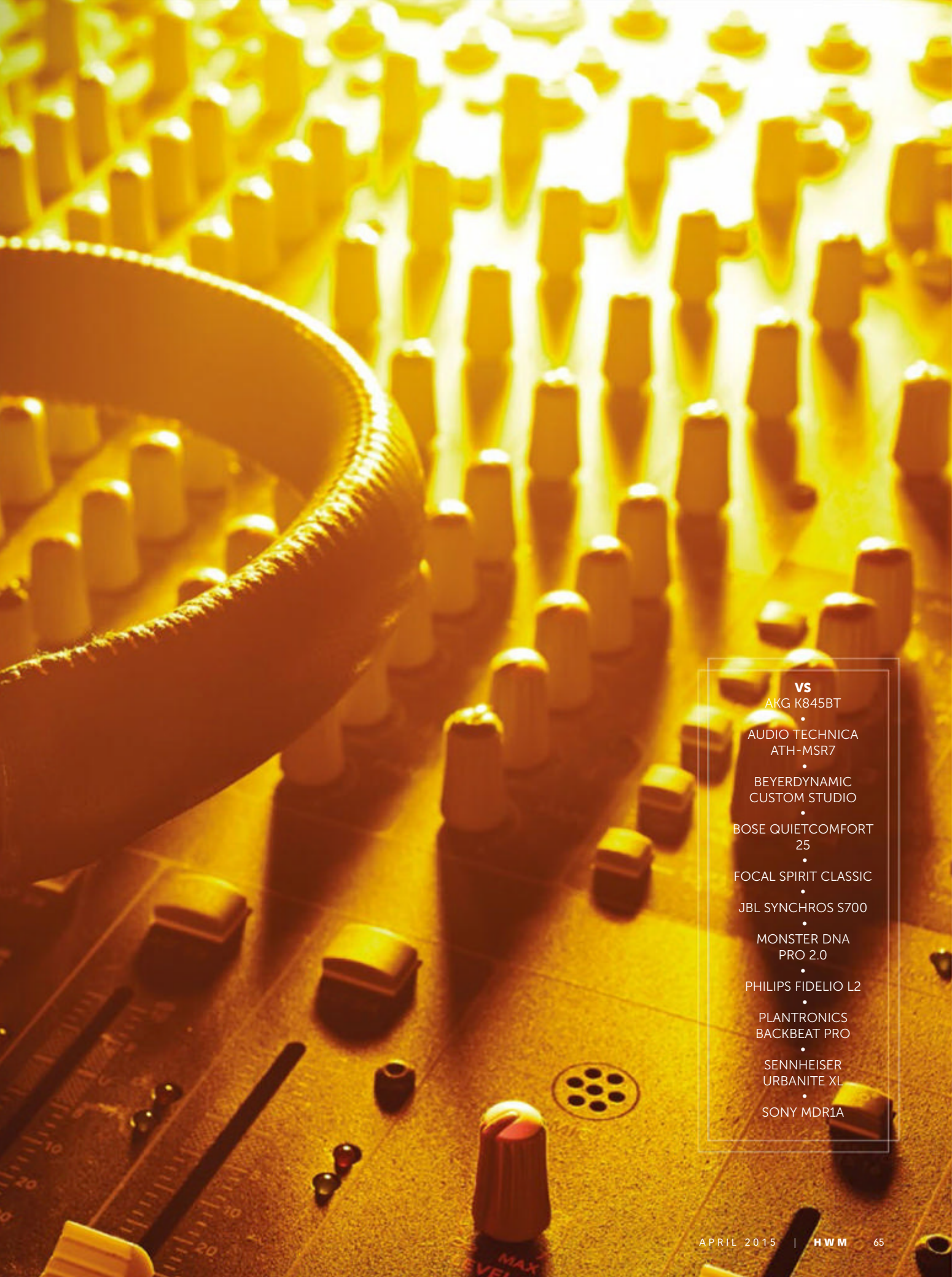
Nowhere is the question of “value” and “best” more relative than in the audio world, where the price of components alone can go up to the thousands. That said, there’s always a place for the best of the year, so here’s a shootout to determine which comes up tops.

Text by *Marcus Wong*

Photography by *Jasper Yu + Zaphs Zhang*

Art Direction by *Ken Koh*

Location by *Backbeat Studios*



VS

AKG K845BT

•

AUDIO TECHNICA
ATH-MSR7

•

BEYERDYNAMIC
CUSTOM STUDIO

•

BOSE QUIETCOMFORT
25

•

FOCAL SPIRIT CLASSIC

•

JBL SYNCHROS S700

•

MONSTER DNA
PRO 2.0

•

PHILIPS FIDELIO L2

•

PLANTRONICS
BACKBEAT PRO

•

SENNHEISER
URBANITE XL

•

SONY MDR1A

AKG K845BT

The AKG K845BT is a futuristic looking pair of headphones with an industrial finish to match. At first glance the headphones may look stiff given how blocky the headband appears to be. When you actually put them on though, the headband proves to be extremely supple, so the K845BT almost melds to your head. Add a pair of nice, plush protein leather cushions on the earcups and you get an extremely comfortable pair of headphones that are light enough (they weigh about 288g) to keep on all day.

What's good is that the headphones support a Bluetooth connection so you can use them wirelessly as well. The K845BT charges via USB and supports NFC for easy pairing, while still working in passive mode via a detachable audio cable. Basic controls line the side of the earcup, and work to adjust the volume and start/stop playback. The same button will work to pick up calls, but there isn't a mic built into the headphones, nor does there seem to be one on the cable, so you'll still need to

keep your smartphone within arm's reach if you're looking to take calls.

In terms of audio, we felt the headphone provided a nice, warm sound with an open soundstage that bordered on being airy. It seemed like this set had the least bass of the group, but provided good detail and a great sense of naturalness. That isn't to say that the K845BT was lacking in bass overall. For example, there was enough of a palpable thump on the bass notes of Rebecca Pidgeon's *Spanish Harlem* in our testing to anchor the track, while letting the headphones exhibit its ability to image everything from the shakers to the piano nicely.

Overall, we'd say the K845BT handles most genres well. Live pieces with instrumentals like The Eagles' *Hotel California* play well to its strengths, giving it plenty of details to pick up and letting it show off its wide soundstage, while faster tracks like Tiesto's *Elements of Life* help to show off its ability to handle the faster attack of trance and dance tracks.



**Bluetooth enabled
so you can use them
wirelessly.**



**No built-in mic
despite supporting
call pick-up.**



AT A GLANCE

Frequency response

20-20kHz

Driver Size

50mm

Impedance

32ohm

Weight

288g

Price

\$499.90



Controls by the side of the earcup allow you to skip through tracks.



The AKG K845BT charges via microUSB.



Markings on the metal band allow for precise adjustment for fit.

AUDIO TECHNICA ATH-MSR7

The Audio Technica ATH-MSR7s may be the cheapest headphones in this shootout, but they certainly proved that price isn't necessarily a good indication of performance. These sleek headphones have a fairly streamlined profile that's clean and elegant. No unnecessary elements here; just large, soft memory-foam ear pads that look large enough to fit over anyone's ears.

This is Audio Technica's first High Resolution Audio headphone, and we're told the housing has been specially shaped with ear-profiled grills to mirror the shape of your ear so that the lower end sounds are more enhanced. We found the headband to be a little stiff, but the flexibility of the swivel on the earcups made it decently easy to get a good fit. These are another pair of fairly light headphones at 290g, and we do feel you could easily keep them on for long periods of time.

On the whole, the ATH-MSR7 lives up to its designation of a "High Resolution" headphone. Vocals are clear and clean, while the headphones exhibit a bit of a clinical nature,

with less warmth and bloom on instruments as compared to some of the other headphones in this shootout.

We'd say that these headphones have good dynamics, with performance weighted more towards the mid and high notes. You might find bass to be a little dry on some tracks, but in return you get plenty of detail. For example, on a recording of *I Love Paris*, Johnny Frigo's violin-work leads a full band on a frenetic pace, yet throughout the crash and swell of instruments you never lose the work of the bass guitar as it paces the piece from the background.

On our usual testing tracks, the ATH-MSR7 performed best with Buckethead's *Sail On Soothsayer*, as the track played well to its strengths of a wide soundstage that also had a good sense of depth. The electric guitar was very nicely rendered with just enough of the sustain captured for that haunting, brooding riff to capture your attention. *Hotel California* by the Eagles, however, didn't quite impress the same way as we felt the track really needed more bass.



Great price to performance ratio.



Bass can be a little too dry on certain tracks.



AT A GLANCE

Frequency response

5Hz-40kHz

Driver Size

45mm

Impedance

35ohm

Weight

290g

Price

\$278.00



The in-line remote is smartphone compatible with controls and mic.



The headphones fold down for storage.



The headband is slightly geared for better adjustment.

BEYERDYNAMIC CUSTOM STUDIO

You might say the Beyerdynamic Custom Studio looks the most imposing of all the headphones in this shootout, with its all-black finish and strong angular lines. Contrary to what their design might suggest though, the Custom Studios are actually quite comfortable on the head. There isn't a sense of clamping at all with these headphones, and the velour ear pads seem to fit well enough to provide a good amount of passive noise cancelling, blocking out a fair amount of the ambient noise around us.

The "custom" part of these Custom Studios lies in how it features user-replaceable covers, rings and headband cushions, allowing you to really change how it looks. But of greater interest in terms of audio is the ability to affect the sound by way of a slider that adjusts the balance of bass to treble.

With an impedance rating of 80 ohms, the Beyerdynamic Custom Studio was easily the hardest headphone of the group to drive, requiring us to push up the volume quite

significantly whenever we put them on. That said, we do feel that they were also the most clinical of the group, which lends to it being perhaps slightly less exciting or "fun".

For example, on a recording of *Correnteza* by Ana Caram, you'll feel like every audio element has been placed nicely into layers of sort, so that every instrument can be heard – from the cello to the drums to the chimes that ring in the early parts of the song to bring in Caram's vocals. The bass beats are just strong enough to be felt, and there is good separation between individual instruments, but you get the sense that the upper mids register just that bit better. For example, the cello sections seem just that bit

more fleshed out as compared to the bongo drums.

On our usual testing tracks, *Hotel California* by the Eagles stood out, as the Custom Pros seemed to bring out every single detail. From the stereo effect of the shakers to the finger work on the solos, it's all there and so you feel like you're right there too.



Slider feature allows you a choice of four audio profiles.



High impedance makes it hard to drive.



AT A GLANCE

Frequency response
5Hz-35kHz

Driver Size
45mm

Impedance
80ohm

Weight
290g

Price
\$499.00



These knobs allow you to alter the sonic profile of the Custom Studios.



The Custom Studios come with a long coiled cable that's perfect for the recording studio.



The headband can easily be switched out.

BOSE QUIETCOMFORT 25

The QuietComfort 25s take over from the QuietComfort 15s as the best noise-cancelling headphones in the market, proving that maybe Bose really knows something that the rest of the headphone makers don't. In terms of design, the QuietComfort 25s carries a somewhat modified design from its predecessor, retaining the overall shape but drastically toning down the flash, making it look cleaner and smarter, ideal for business travelers.

Compared to some of the other headphones in this shootout, the cushioning on the headband of the QuietComfort 25s may seem minimal, but the headphones do still feel comfortable on the head, something we chalk up to the lighter weight of this set.

The QuietComfort 25s weigh a mere 195.6g, and fold down nicely to fit into the compact case provided, making them perfect for travel. While you will need a single AAA battery to power the noise-cancelling feature, the good thing is that Bose has designed the QuietComfort 25s so they will now continue to operate passively, a major bugbear with the QuietComfort 15s.

+
Excellent noise canceling.

-
Lacks the detail found in other sets.

In terms of audio, we'd say the QuietComfort 25s have a slightly warm and forward sound. They handle classical and instrumental pieces fairly well (it seems there's

even extra effort made to emphasize stereo effects), but it can also sound slightly clipped on pieces with a heavy bass line, like Far East Movement's *Like a G6*.

Moving on to Rebecca Pidgeon's *Spanish Harlem*, we thought the vocals were rendered sweetly, while the piano and string accompaniments had just enough warmth without sounding bright. However, there wasn't quite as much depth in

the bass, so that's perhaps an indication of the overall sound signature of these headphones.

Tiesto's *Elements of Life* again demonstrated that bass clipping. While the leading bass thump is obviously there, the sections of the song where the bass brings you down in a descending crescendo seem a little recessed, which in a sense is in line with the laidback nature of these headphones. Overall, we'd say the QuietComfort 25 is a good performer, but nothing particularly stands out amongst this crowd of top performers.



AT A GLANCE

Frequency response

-

Driver Size

-

Impedance

-

Weight

195.6g

Price

\$529.00



The new QuietComforts feature a cleaner design.



Basic volume controls on the inline remote.



The redesigned hinge allows the earcups to sit closer to your ears.

FOCAL SPIRIT CLASSIC

As the name implies, the Spirit Classic really does have the makings of a classic. The “Hot Chocolate” metallic finish is eye-catching without being gaudy, and the overall design is modern without being too forced. You won’t find extraneous flashes of gloss here; just solid bronze anodized aluminum capped off with equally solid memory foam earpads. Personally, we found the fit to be a bit too strong, resulting in headphone clamping around the ears, making it less suitable for long periods of use.

In terms of sound, the Spirit Classic displays a good sense of dynamics and ability to resolve detail, though it does seem to have less bass compared to the Spirit One. Focal notes on its website that the 40mm drivers have been tuned to bring out the best of the mylar/titanium transducers used, with a frequency response curve that’s flat in the low frequencies.

In our own testing, we found that the Spirit Classic did indeed display good dynamics and detail; a testament to the baffle design and thinner mylar/titanium transducers

perhaps. There’s easily enough attack for the headphones to tackle faster moving tracks, and the set will pretty much play anything with vocals or extended instrumental parts well.

For example, on Ana Caram’s *Correnteza*, the Spirit Classic produced perhaps the most refined rendition of the group, with a distinct emphasis on the mids and trebles. Even the faint finger squeaks of guitarists changing their fingering on the fret boards were picked up, and the headset also gave weight to some of the backing instruments behind, resulting in a fuller sound overall.

Another thing we found was that the Spirit Classic exhibits a smaller, more intimate soundstage, something that works well for live “unplugged” tracks perhaps. On our own test tracks, we found that it performed best with Buckethead’s *Sail on Soothsayer*. With the guitar riffs running mostly in the mids to high trebles, the Spirit Classic rendered it with a nice ring, while still imaging the backing track well. Overall, this was one of the more impressive headphones, if not for the flat low end and the headphone clamp.



Great overall performance especially in terms of dynamics.



Fit is a little too tight for extended periods of wear.



AT A GLANCE

Frequency response
5Hz-22kHz

Driver Size
40mm

Impedance
32ohm

Weight
310g

Price
\$499.00



These joints allow the earcups to swivel in for storage.



A single-button in-line remote allows you to pick up calls.



The 3.5mm audio jack seems to be slightly reinforced.

JBL SYNCHROS S700

Easily the most industrial looking of them all, the JBL Synchros S700 almost reminds you of industrial fans with its grill cover design. While the ear cups don't fold in themselves, they do rotate inwards for a slightly slimmer profile. There's a lot of metal used on this headphone, making it feel very solid to touch, but at the same time, the stainless steel headband is fairly flexible, making it easy to get a good fit.

Clamping is firm but not uncomfortable thanks to the generously cushioned leather earpads that provide a decent seal from the environment, adding some passive noise cancelling to the mix. The headphones come with a detachable cable with in-line remote that's meant to work with both Android and iOS devices, plus a rechargeable Li-ion battery built-in to power JBL's LiveStage digital signal processing technology for up to 28 hours, but the set will work fine in passive mode too, which is a good thing because we actually thought it sounded better with LiveStage off.

On certain tracks, the DSP actually killed

the rich rumbling bass that the Synchros S700 has, artificially flattening the sound. On others it works decently well, giving the impression of a wider soundstage, but the fact is that the

headphones sound perfectly fine without any processing applied with a great lower mid-bass range.

That lush lower mid-bass range becomes more evident on tracks like *Spanish Harlem*, where the opening bass notes resonate sweetly, drawing you into the song. Rebecca Pidgeon's vocals are never lost in the presentation, nor are the strings when they come in together with the piano accompaniment. We'd say this was safely one of the best

reproductions of this particular track we've heard so far, and it certainly seems to highlight the strengths of the Synchros S700.

Overall, the Synchros S700 exhibits a warm and sweet sound signature, with a good wide soundstage and plenty of detail in the lower registers. It handles fast tracks pretty well, and picks up details well too as evidenced on tracks like Michael Jackson's *Billie Jean*, and The Eagles' *Hotel California*.



Very nice lower mids and bass.



Built in DSP doesn't work well on all tracks.



AT A GLANCE

Frequency response

10Hz-22kHz

Driver Size

50mm

Impedance

34ohm

Weight

323g

Price

\$500.00



The in-line remote has a microphone for calls.



The Synchros S700 is unabashedly industrial-looking.



Pressing in on the left earcup activates the DSP.

MONSTER DNA PRO 2.0

The Monster DNA Pro 2.0 was one of the pleasant surprises of the group, as the somewhat out-of-this-world design belies a very competent all-around performer. While the earcups may look to be slightly stiff, they do make for a pretty good fit, though we do think they could be slightly larger as there tends to be a bit of clamping after a while.

The headphones fold down for easy travel, and it comes with a selection of cables, a carrying pouch, and a cleaning cloth for getting fingerprint marks off that smooth surface. What's unique about these headphones is that each earcup has an audio jack embedded, meaning that you can run a cable from one DNA Pro 2.0 to another, effectively allowing you to share your music. If you have more DNA Pro 2.0s, you can most probably run the daisy chain even further, but we're not sure how practical that would be.

In terms of audio performance, we were very impressed by the way the DNA Pro 2.0 handled

all the genres we threw at it. The headphones have a slightly forward sound, and seem to be a little bright-sounding overall, with a touch too much extra ring on those high notes.

While there is a good amount of bass, there isn't quite as much definition in the lower registers as some of the other headphones in this shootout.

Listening to a recording of *I Love Paris* by Johnny Frigo, we found that the DNA Pro 2.0 put up a great display of dynamics, easily keeping up with the pace of the fast-moving piece. While we felt that the bass could have done with a bit more depth and detail, this perhaps proved to be indicative of how

the focus of these headphones is very much to be in the mids.

This is again reinforced with Tiesto's *Elements of Life*, as the track has good dynamics and allows the DNA Pro 2.0 to show off its ability to handle the attack of faster moving pieces. The thumping bass and exciting sound also seem to work well with the smaller soundstage in this case.



Quite a good with all genres of music.



Lack of definition in the lower registers.



AT A GLANCE

Frequency response

-

Driver Size

-

Impedance

-

Weight

270g

Price

\$490.00



The DNA Pro 2.0 has an angular design.



A single-button in-line remote allows you to pick up calls.



Two audio jacks below means that a friend can plug in too.

PHILIPS FIDELIO L2

The Philips Fidelio L2 first catches your attention with its loud, industrial design. That mesh grill is reminiscent of medieval knights of old, while the black leather headband is very much accentuated by the bright orange stitching that runs across it.

The headphone itself feels fairly light on your head though we'd put that mostly due to the ample cushioning on the headband. Memory foam has also been used generously on the earpads, so they'll conform to the shape of your ears, giving you a better seal over time.

Apparently, the speaker drivers are even tilted to match the ear's natural angle, ensuring that all sound goes direct into your ear canal.

There's an in-line mic on the cable, with a pick-up button so you can take calls without having to take the headphones off, but the semi-open design of these headphones mean they will definitely leak sound, so you'll probably want to watch who's around you before you start talking.

Tuning in to *Spanish Harlem*, the Fidelio L2 made us sit up and take attention from the

very first bass note. Nice, round and full, the Fidelio L2 gave us bass notes with weight and presence. Rebecca Pidgeon's vocals were slightly forward with a great sense of presence,

but more importantly, lingered in the air arrestingly, leaving us captivated.

On our standard test tracks, the Fidelio L2 performed excellently, with good amounts of detail with every recording. In particular, we'd say *Hotel California* by the Eagles and *Elements of Life* by Tiesto stood out as the lush bass of the Fidelio L2 complemented both tracks perfectly. Add to that a nice, expansive sound stage, and you have the makings of a

very engaging listening session.

Overall, we'd say that the full bass and excellent clarity of these headphones makes them perfect for instrumental pieces. There's an excellent sense of imaging, and you'll easily be able to distinguish between the individual instruments and artistes. There's a level of comfort with these headphones that are better than most, and what you lose in effective noise sealing you gain in terms of ventilation for your ears.

**+
Nice lush bass with presence.**

**-
Semi-open design leaks sound.**



AT A GLANCE

Frequency response

12Hz-25kHz

Driver Size

40mm

Impedance

16ohm

Weight

260g

Price

\$449.00



The grill design actually help to achieve acoustic precision.



The loud orange stitching is perhaps the L2's most distinctive feature.



The cable features a universal remote for taking calls.

PLANTRONICS BACKBEAT PRO

Looks-wise, the BackBeat Pro is probably the least visually appealing as it has a distinctly utilitarian design – from the oversized earcups and cushioning that seem to be a little bloated and unwieldy, to the large dials and blatantly obvious control buttons on both sides.

However, all that cushioning makes the BackBeat Pro easily one of the most comfortable headphones of this shootout, and we've found that the size of these controls make it extremely easy for you to control playback without even looking. Given the fact that the BackBeat Pro is also wireless enabled (Bluetooth), that means you can easily control your music without having to take your player out of your pocket.

It also must be said that the BackBeat Pro has noise-cancelling capabilities and an internal battery that runs for a good 24 hours on a single charge, while being able to run passively through a detachable audio cable as well. With all this in mind, it's easy to get the idea that this might well be one of the more well rounded performers out there.

+
Most feature-rich
of the group.

–
Looks are also the
most plain.

A recording of *Cloverfoot Reel* by Yo-Yo Ma, Edgar Meyer and Mark O'Connor opens with the deep, dark strokes of Meyer's double bass, which continues to resonate in the background while Yo-Yo Ma and O'Connor join in with their cello and violin respectively. The result is a melodious swirl of emotion that envelopes you perfectly.

Shift over to *Spanish Harlem*, and robust bass line of the BackBeat Pro comes into play, with a palpable thump with every bass note. Rebecca Pidgeon's voice lingers hauntingly on this piece, and there is perhaps just a touch less definition on the piano parts as compared to some of the other more expensive headphones in this shootout.

Overall, we'd say that we're very surprised at how these headphones can rock with the best of them and yet still handle finer instrumental pieces capably. We do think that the value of sheer functionality in terms of design shouldn't be overlooked, but in terms audio quality, the BackBeat Pros are solid versatile performers that just fall short of the top performers in this category.



AT A GLANCE

Frequency response
20Hz-20kHz

Driver Size
40mm

Impedance
-

Weight
340g

Price
\$379.00



The large play/pause button also doubles as a NFC spot for pairing.



Active noise-cancelling at the flip of a switch.



A basic in-line remote allows for quick volume adjustment.

SENNHEISER URBANITE XL

With a name like "Urbanite XL", you can probably guess the target market for these headphones—millennials who are "smart consumers who won't compromise on quality". Or so say Sennheiser, at least. What we do see is that the headphones boast a fresh, young design and are both light and hardy.

The fabric wrapped headband in particular is impressively flexible, and we're told it's cushioned with silicon so that you can wipe it down after wear. The sliders work well and are also solidly built, and the Urbanite XLs feel pretty comfortable on our head thanks to the way the flexibility of the entire set allows it to adjust to the shape of our heads.

There's an in-line remote with microphone for taking calls and adjusting the volume of playback, while a tangle-free flat cable has been used to keep everything manageable. That said, the headphones come with their own special storage pouch so there really shouldn't be any worry with packing these headphones for travel.

+
Strong, flexible and light construct.

—
Sound could be more refined.

You might be tempted to dismiss the Urbanite XLs as more of a lifestyle item than a serious headphone, but our testing has shown them to be more than competent. Listening

to *Under the Bridge* by the Red Hot Chili Peppers was a most enjoyable experience for example, as the Urbanite XLs render the track nicely, maintaining good separation between Anthony Kiedis' vocals and the hi-hat (and guitar) work in the early going. Ironically enough for a headphone that's built with a great emphasis on bass, we actually found the bass on this track a bit lacking in depth, but the track was a fairly good listen overall.

On our usual test tracks, we thought the headphones performed best with *Hotel California* and *Sail on Soothsayer* by The Eagles and Buckethead respectively, as both tracks carry heavy guitar sections that allow the Urbanite XL to show off its ability to render detail while being paced by a bass beat that taps onto the Urbanite XL's lower range nicely. Overall, we'd say the headphones are good performers that lack just that last bit of detail compared to our top performers.



AT A GLANCE

Frequency response

16Hz - 22kHz

Driver Size

32mm

Impedance

18ohm

Weight

315g

Price

\$339.00



The headphones are highly adjustable for a perfect fit.



The Urbanite XL has a 3-button remote with integrated mic for calls.



The headband is also surprisingly flexible and strong.

SONY MDR1A

The Sony MDR1A is unique in the fact that it supports USB audio, meaning that instead of letting the media player convert a digital signal into an analog one for playback, these headphones will take a digital signal direct from the player and do the conversion themselves.

In theory this should mean a more accurate conversion, and so a better sound overall, but at the moment support for this feature is limited to players that have audio out by either lightning, microUSB or one of Sony's USB cables (Essentially their Xperia and Walkman models). In our testing, we ran all the headphones through a dedicated USB DAC for fairness, but we did try testing it with our iPhone 6 via the supplied lightning cable and we can confirm that it improves the audio quality slightly.

Sony labels the MDR1A as a premium high-resolution stereo headphone, and it certainly seems like it was engineered that way. The headphones have a classy design with plush ergonomic earpads and a flexible headband that allows the MDR1A to conform nicely to your head.

+
Excellent frequency response.

—
DSP feature doesn't work with all headphones.

40mm aluminum-coated liquid crystal polymer diaphragms give the headphones an incredible frequency response range of 3Hz to 100kHz, which means the audio range extends well beyond what most musical instruments (and the human voice) can produce, so every single sound should be captured.

That certainly seemed to be the case with our testing, as we found that the MDR1A exhibits great dynamics, are comfortable to wear, and give you great detail from the extreme low end all the way to the very high notes. Instruments are rendered with great clarity, and you can physically feel the resonance on the low end, as there's a palpable bass thump when called upon.

For example, on *Spanish Harlem*, the opening bass beats had both depth and presence, and Rebecca Pidgeon's vocals lingered hauntingly in the air. The introduction of shakers to the piece added another dimension and we felt that the piano notes were well controlled, bright without being sparkly. Imaging was superb of course, and you get a good sense of atmosphere with these headphones.



AT A GLANCE

Frequency response
3Hz-100kHz

Driver Size
40mm

Impedance
24ohm

Weight
225g

Price
\$499.00



The Sony MDR1A folds flat for storage.



Volume controls on the right earcup allow for quick adjustments.



USB ports allow you to use cables that take digital audio direct.



	AKG K845BT	AUDIO TECHNICA ATH-MSR7	BEYERDYNAMIC CUSTOM STUDIO	BOSE QUIETCOMFORT 25	FOCAL SPIRIT CLASSIC	JBL SYNCHROS S700
TYPE	Closed-back, Wireless	Closed-back	Closed-back	Closed-back, Noise-cancelling	Closed-back	Closed-back
IMPEDANCE	32ohm	35ohm	80ohm	-	32ohm	34ohm
SENSITIVITY/SPL	102dB	100dB	96dB	-	102dB	117dB
THD	-	-	<0.2%	-	<0.3%	-
FREQUENCY RESPONSE	20Hz-20kHz	5Hz-40kHz	5Hz-35kHz	-	5Hz-22kHz	10Hz-22kHz
DRIVER SIZE	50mm	45mm	45mm	-	40mm	50mm
WEIGHT	288g	290g	290g	195.6g	310g	323g
PRICE	\$499.90	\$278.00	\$499.00	\$529.00	\$499.00	\$500.00



	MONSTER DNA PRO 2.0	PHILIPS FIDELIO L2	PLANTRONICS BACKBEAT PRO	SENNHEISER URBANITE XL	SONY MDR1A
TYPE	Closed-back	Semi-open	Closed-back, Wireless, Noise- cancelling	Closed-back	Closed-back
IMPEDANCE	-	16ohm	-	18ohm	24ohm
SENSITIVITY/SPL	-	105dB	-	110dB	105dB
THD	-	<0.1%	-	<0.5%	-
FREQUENCY RESPONSE	-	12Hz-25kHz	20Hz-20kHz	16Hz - 22kHz	3Hz-100kHz
DRIVER SIZE	-	40mm	40mm	32mm	40mm
WEIGHT	270g	260g	340g	315g	225g
PRICE	\$490.00	\$449.00	\$379.00	\$339.00	\$499.00

THE BEST HEADPHONES IS



PHILIPS FIDELIO L2

This eventually came down to a choice of three headphones – the Sony MDR1A, the JBL Synchros S700, and the Philips Fidelio L2. While they each had their merits, the one that consistently sounded excellent on all tracks was the Philips Fidelio L2. It also proved to be the most comfortable. The JBL Synchros S700 was a little clumpy and so would not wear as well over long periods, and the Sony MDR1A was a little more bassy than to be accurate, while costing some \$50 more. Thus, the winner is the Philips Fidelio L2.

PLANTRONICS BACKBEAT PRO

We were tempted to give this to the Audio Technica ATH-MSR7 as the price to performance ratio of that set is certainly exceptional. However, when you consider the sheer number of features the BackBeat Pro has – noise cancelling, wireless capabilities, 25-hour battery life, full controls for playback on the headset – and the audio performance it brings, then this award is a no-brainer.

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TRACK YOUR LIFE

The market for wearables is expected to grow exponentially, and it seems now that not a day goes by without a new activity tracker being announced or released, but getting your hands on a good one is a different matter. Here's a quick breakdown of the three that are making waves today.

Text by *Kenny Yeo*

Photography by *Vee Chin + Zaphs Zhang*

Art Direction by *Ian Chong*

VS
JAWBONE MOVE
•
MICROSOFT BAND
•
STRIIV FUSION

JAWBONE MOVE

Jawbone is arguably one of the most prominent names in the activity tracker market, thanks in no small part to the distinctive design of its Up tracker. However, it had its foibles and was one of the pricier brands in the market. The Move was born instead as an alternative.

The Move comes as a simple-looking clip-on tracker, so you would definitely want to invest in a wristband - sold separately - as it greatly improves wearability and accuracy. The tracker itself is made of plastic, while both the clip and wristband are made of medical grade hypoallergenic TPU rubber. Both the tracker and wristbands are available in variety of colors. Wearing comfort is top notch, thanks to the soft rubber wristband. And because the tracker weighs a scant 6.8g, you wouldn't even notice it on. However, its somewhat tacky design might not be to everyone's tastes.

One of the key new features of the Move is splash resistance. According to Jawbone, users can safely wear the Move even when showering - something which users couldn't do with the older Up and Up24. However, users should still take care not to submerge the Move as it is not entirely waterproof. Still, this means that for most users, the Move can truly be worn all day, and this improved convenience is really much welcomed. Speaking of convenience, the Move uses a regular button-sized non-rechargeable battery, so there's no need to fret over constant charging. Furthermore, Jawbone claims that

users can expect up to six months of battery life from the Move.

Also improved is the LED status notification system. The old Up24 only had two indicators which flash intermittently or glow solidly to show different statuses and modes. The Move improves on this by having a system of 14 LED indicators. There are 12 white LED indicators that form a ring around the Move and can be used to tell time and indicate the progress towards your daily goals. The other two orange and blue indicators are used to show what mode the Move is in.

The Move uses MotionX sensor technology, which has proved itself as one of the more accurate systems around. You can even use the accompanying Up app to calibrate the tracker to your strides. The Up app also remains as one of the most beautiful and easy to use apps, quickly showing daily progresses or history records at a glance.

You can also use the app to record calorie intake. This can be done by manually creating an entry or referring to a built-in database. However, the most helpful has got to be the bar

code scanner, where users can simply just take a photo of the bar code on the food's packaging and the app will cross reference with its database.

A week with the Move, and I've got to say that it is a great new activity-tracker from Jawbone. It is convenient to use, comfortable to wear and the Up app continues to be one of the most intuitive and functional around.

+
Light and comfortable to wear. Truly splash-resistant.

-
LED indicators can be hard to understand. Tacky design. Wristband is sold separately.



AT A GLANCE

Connectivity

Bluetooth 4.0

Claimed battery life

Up to 6 months

Weight

6.8g (tracker only)

Price

\$88 (tracker only)



LED indicators on the Move allow users to keep track of their progress and also tell the time.



The Up app lets users check on their daily progress and history in a quick glance.



The Move uses a replaceable CR2032 battery and has a battery life of up to six months.

MICROSOFT BAND

The Microsoft Band is the company's first foray into the activity tracker market and it is an interesting device because of its numerous features. Apart from having an integrated heart-rate sensor, it also sports a relatively large 1.4-inch full-color TFT touchscreen display that offers a resolution of 320 x 106 pixels. To power this display requires lots of juice and the Band has not one but two 100mAh rechargeable lithium-ion batteries. Microsoft claims a battery life of around 48 hours, but I managed much better and got around 72 hours to 84 hours out of the twin batteries.

Because of the large display and twin batteries though, the Band is not very comfortable. It is heavy, thick and has an inflexible, somewhat odd semi-circular shape. It seems to be prone to hitting things; I kept unintentionally banging the clasp against my work desk. While Microsoft claims that the Band is both dust and splash-resistant, they also warn against wearing the Band while showering and swimming. So, in order to play it on the safe side, I ended up taking it off whenever it could potentially get the Band wet - such as chores around the house or washing the car. You can imagine how inconvenient this became.

Fortunately, the Band redeems itself by being one of the most full-featured activity trackers in the market. Apart from an integrated optical heart-rate sensor, it also has a built-in GPS that

can be paired with a dedicated running app such as RunKeeper. There are also other sports mode such as cycling and running. The Band even has a UV ray analyzer function, measuring sunlight exposure when you're out and out; telling if you need to put on sun block.

The large touchscreen display is both a boon and a bane. While it makes the Band uncomfortable to wear and somewhat ungainly look at, it is also great for receiving notifications as it can display up to three lines of text, making it easy to quickly read notifications at a glance.

The Band works with Microsoft's Health platform and is compatible with Windows Phone, Android and iOS devices. The Microsoft Health app is well-designed, easy to use and offers detailed insights on one's activity and sleep habits. Apart from the app, Microsoft also offers a desktop client for Windows and Mac systems, and also a web dashboard which can be accessed simply by logging in online through any web browser. I found it to be very accurate in keeping track

of the number of steps I took, but its sleep monitoring performance seems erratic and a too sensitive to movements. I certainly don't remember waking up that many times at night.

The Microsoft Band is a decent first attempt and while I like its breadth of capabilities, I was unimpressed by its clunky design, lack of comfort, and iffy water-resistance, which makes it less convenient to wear.

+
Lots of useful features. Bright, legible display.

-
Chunky design and uncomfortable to wear. Not water-proof.



AT A GLANCE

Connectivity
Bluetooth 4.0

Claimed battery life
48 hours

Weight
60g

Price
US\$199.99



The Microsoft Band's is magnetized, which makes charging a breeze.



The Microsoft Health app has pleasant graphics and is easy to use.



The Microsoft Band is one of the few activity trackers in the market to have a heart-rate sensor.

STRIIV FUSION

The name might be unfamiliar to you, but Striiv has actually been making activity trackers as far back as four years ago. Early trackers from Striiv combined game mechanics to encourage users to be more active, and were seen as a fun way to motivate its wearers. The latest Fusion still keeps this fun aspect, but is a much more matured and grown-up device.

The Fusion has a 0.8-inch LCD touchscreen made from ion-hardened glass - a similar chemical hardening process is used by Apple to make the displays for the iPhone 6. The touchscreen is useful because it shows very quickly how many steps you have taken, distance covered and calories burnt. It will also show you notifications from your phone, though we found it a little erratic as some notifications just doesn't seem to get synced.

There are no physical buttons, and all navigation happens on the screen. Double tap to activate and swipe to switch between functions. It feels slightly unresponsive, so you'll need to make deliberate actions.

Striiv claims a battery life of seven days; we managed to get around five days of usage, which is still very decent all things considered.

The Fusion also comes with two interchangeable wristbands of different colors so you can change the look of the device. The bands are made of rubber and are comfortable to wear even if they are a little stiff. This made wearing it for the first time a little tricky as the

holes on the band are not quite big enough to buckle. Nonetheless, wearing the Fusion and its wristbands caused no discomfort as they are supremely light. In all, the Fusion weighs only about 16g. This, coupled with the fact that it is water-resistant and suitable for taking into the shower, means we could wear the Fusion all day with no problems.

Unfortunately, while it is very comfortable for all-day usage, I felt that the Fusion sensor was a tad too enthusiastic when it came to footstep tracking accuracy, giving me more credit that I probably deserved. This was the same for its

sleep monitoring too. Similar to the Microsoft Band, it was rather erratic in its recording of the number of times I wake up at night.

The Fusion connects to your device using the Striiv app. The app is easy to use, but does not provide a detailed breakdown of your activity history unlike Jawbone's Up and Microsoft's Health app. And since Striiv made its name by using game mechanics to encourage users to be more active, it is only fitting that inside the Striiv app is a fitness game called MyLand.

The idea behind MyLand is to build a thriving island community and objects using energy which can be earned by simply walking more.

While the overall performance of the Striiv Fusion can be inconsistent from time to time, it is a fun little device to use. It is also very affordable, as you'll be hard-pressed to find another full-fledged activity tracker that comes with a touchscreen capable of notifications.

+
Lightweight and water-resistant. Affordable.

-
Touch display not responsive. Tracking can be erratic.



AT A GLANCE

Connectivity

Bluetooth 4.0

Claimed battery life

7 days

Weight

16g

Price

\$149



The Striiv Fusion's charger has clips on the side and can be tricky to put on.



The Striiv app has a fitness game that encourages users to be more active.



The Striiv Fusion does come with additional bands, allowing users to change its looks.



MODEL	JAWBONE MOVE	MICROSOFT BAND	STRIIV FUSION
SIZES	1	1	3 (Small, Medium, Large)
PEDOMETER	Yes	Yes	Yes
SLEEP MONITOR	Yes	Yes	Yes
HEART-RATE MONITOR	No	Yes	No
WORKOUT MODE	Yes	Yes	No
BUILT-IN GPS	No	Yes	No
BATTERY LIFE	Up to 6 months	2 days	7 days
SHOWER-PROOF	Yes	No	Yes
COMPATIBILITY	Android and iOS	Android, iOS and Windows Phone	Android and iOS
WEIGHT	6.8g	60g	16g
PRICE	\$88	US\$199.99	\$149

HOW DO HEART-RATE SENSORS WORK?

Activity trackers with heart-rate sensors typically use optical technology to obtain a reading of your heart-rate. These sensors work by using a bright LED light to shine through the skin. Light is reflected back and the sensor analyzes the reflected light. Since blood absorbs more light, changes in the amount of light reflected back can be translated as heart beats. While this all sounds good in theory, in practice, however, such sensors can be finicky to use. To begin, skin tone will affect readings as will movements and sweat. As a result, readings can sometimes vary widely and be inaccurate. Hence, the most accurate reading can only be obtained if you are absolutely still.



THE BEST ACTIVITY TRACKER IS



JAWBONE MOVE

An activity tracker should ideally stay with you all day, regardless of what you are doing. And it needs to accurately measure all your activity levels - both steps and sleep. Otherwise, what good is an activity tracker if the data it collects is unreliable? Of the three activity trackers that are gathered here, the one that does this the most consistently and accurately is the Jawbone Move. The MotionX platform has proved itself to be one of the most dependable activity-tracking solutions in the market right now, and the Move was the most accurate and consistent in our testing. Furthermore, the fact that the Jawbone Move is shower-resistant (though not entirely waterproof) means that you can wear it all-day, which makes it more convenient and effective to wear and use.

TWO BIRDS, ONE PHONE

YotaPhone 2

AT A GLANCE

Operating system
Android 4.4 KitKat

Display
Front - 5.0-inch
1,920 x 1,080 pixels
AMOLED
Rear - 4.7-inch
960 x 540 pixels
e-paper

Processor
Qualcomm Snapdragon
801 quad-core 2.2GHz

Storage
32GB internal storage

Price
\$950



A rear e-paper display makes for a very energy-efficient way to view notifications that do not require full color, high-resolution screen.

CONCLUSION

Unique dual-screen paired with smooth performance and a competent set of custom software makes for a very compelling device.

In the latter part of 2012, Russian company Yota unveiled their first generation YotaPhone, the world's first dual screen smartphone. It had two 4.3-inch displays; an LCD on the front and an e-paper display (EPD) on the back. While most Asian countries missed this first generation device, the updated YotaPhone 2 is available for sale.

The YotaPhone 2 has a 5.0-inch full HD front AMOLED display, which is very bright and dishes out very deep blacks, and vibrant colors. The rear 4.7-inch qHD e-paper display outputs 16-color grayscale. It's meant for low power, always on consumption of text and notifications. While it does what it's expected to do, we did notice that the matte texture of the rear panel mutes contrast and sharpness. The e-paper display also doesn't have a backlight, so you won't be able to view it in the

dark. Conversely, it reads excellently even under direct sunlight. Both sides are reinforced with Corning Gorilla Glass 3 for added durability.

The YotaPhone 2 comes with Android 4.4.3 KitKat installed, plus some Yota apps to let you take immediate advantage of the rear e-paper display. For example, YotaMirror mirrors the Android layout to the rear for extreme power savings while YotaCover is an always on wallpaper to let you customize the look of your phone. The phone comes with 32GB built-in storage, with around 24GB available after taking into account of the preloaded software. There is no memory card expansion slot, but internal storage should suffice for mainstream users for this phone.

Handling the YotaPhone 2 felt awkward initially since you'll have to get used to holding the phone "backwards", with the flat

LCD side against your palm, when you want to view the e-paper display on the back. The left profile of the phone is bare, while the right side houses the volume rocker which doubles as a nano-SIM card slot, and the power button. A 3.5mm audio output jack can be found on the top left, plus a micro-USB port flanked by speaker grilles.

Performance-wise, the YotaPhone 2 is driven by a Qualcomm Snapdragon 801 quad-core 2.2GHz processor and 2GB RAM. This places it in the same league as last year's Android flagship phones, which is still plenty powerful by today's standards. SunSpider JavaScript tests put it in the middle of the pack; slower than the 2014 Motorola Moto X, faster than the ASUS PadFone S. It fared very well in our video looping battery test, lasting close to 9 hours, 30% longer than the same PadFone S.

There's no two ways about it; the YotaPhone 2 is clearly aimed at a niche market segment where consumers are willing to try out unconventional phone designs. It will definitely be a conversation starter when you whip the YotaPhone 2 out in public, but are you willing to fork out around \$950 for last year's flagship, plus an e-paper display?

by *Cookie Monster*



TESTED & RATED

8.0_{/10}

HWM
SINGAPORE



FLEXES AHEAD OF THE PACK

LG G Flex2

AT A GLANCE

OS

Android 5.0 Lollipop

Display

5.5-inch/ 1,920 x 1,080 pixels / P-OLED

Processor

Qualcomm Snapdragon 810 octa-core (quad-core 1.5GHz Cortex-A53 and quad-core 2GHz Cortex-A57) processor

Storage

32GB internal storage microSD expansion up to 2TB

Price

\$998

Like it or not, curved displays are here to stay. The past two years have seen LG and Samsung release a slew of mobile devices with curved screens such as the first G Flex, the Gear Fit and most recently, the Galaxy S6 edge with dual curved edges.

So it should come as no surprise that LG took the wraps off its second-generation curved smartphone, the G Flex2, at CES in January this year. With the new phone, LG refined the original G Flex design with a smaller form factor (149.1 x 75.3mm vs 160.5 x 81.6mm) and steeper 650mm radius curvature, which makes for

a more comfortable and secure grip.

The G Flex2 ships with Android 5.0.1 Lollipop and LG's custom UX interface, previously seen on the G3 last year. Features such as Smart Keyboard and Smart Notice see a return, though LG has introduced three new features, namely, Gesture Shot, Gesture View and Glance View. Gesture Shot allows you to capture a selfie with the phone's 2.1-megapixel front camera with a simple hand gesture from as far as 1.5m, while Gesture View lets you check the last shot immediately after taking a photo or selfie.

On the other hand,

Glance View is evocative of Samsung's Quick Glance, which was introduced on the Samsung Galaxy Note II. But unlike Quick Glance, which requires hovering your hand over the proximity sensor on the Galaxy Note II's front panel, Glance View displays notifications such as time, recent messages, or missed calls with a downward swipe of the display even while the screen is turned off.

For shutterbugs, the new G Flex2 rocks a 13-megapixel rear camera sensor with optical image stabilization (OIS+) and laser autofocus. On a bright, sunny day, we found the



The rear cover of the G Flex2 is protected by DuraGuard Glass, a special chemical treatment technology developed by LG.



The microSD and micro-SIM card slots are located at the top right corner of the phone.

CONCLUSION

Huge improvements over the original in every aspect and an actually decent battery life make for a (more) future-proof investment.

camera to be quite capable of taking good photos with decent detail and accurate color reproduction. But when it came to indoor shots, images appeared less sharp and artifacts a tad more apparent.

On the display front, the G Flex2 appears to have overcome the initial technical limitations of Plastic-OLED technology and stepped up the resolution to 1,920 x 1,080 pixels. LG also shrunk the display to a more manageable 5.5-inches, which helps to bring the pixel density up to a respectable 403ppi. Save for some graininess at low brightness levels and when displaying certain colors, the display exhibits deep blacks, vibrant colors, and good contrast, and those who consume multimedia content such as videos on their phones will not be disappointed.

Under the hood, the G Flex2 runs the speedy Snapdragon 810 64-bit octa-core processor with 2GB of RAM. As expected, Qualcomm's

latest processor helps the G Flex2 pull ahead of its competitors such as the Samsung Galaxy Note 4 4G+ in performance benchmarks for CPU and graphics performance. Powering this beast of a processor is a 3,000mAh battery, which manages to give the G Flex2 quite respectable battery performance. While it isn't a top performer, it manages to hold its own among other brand flagships like the Apple iPhone 6 Plus, lasting just under 10 hours on our video looping benchmark.

Overall, we feel LG should be commended for its efforts in making quite a long list of improvements in its second-generation G Flex phone. There are several aspects of the G Flex2 that we like over its predecessor, such as the full HD display, a more compact form factor, the addition of a microSD card slot that supports up to 2TB cards, smooth navigation, good imaging performance and very decent battery life. With that said, the perceived merits of a curved display

are very much up to individual preference. This is especially so with the release of the Galaxy S6 from Samsung and HTC's new One (M9) at Mobile World Congress (MWC), which will leave those of you looking for a top-end smartphone spoilt for choice.

Still, if sheer performance and the street cred that comes with a curved display that literally flexes and a self-healing back is what you want, you won't go wrong with a phone running the fastest Qualcomm processor that also supports future LTE Cat 9 speeds of up to 450Mbps.

by *Cookie Monster*

TESTED & RATED

8.5_{/10}

HWM
SINGAPORE





AT A GLANCE

Processor

Intel Core i7-4710HQ
(2.5GHz, 6MB cache)

Display

15.6 inch Full HD
(1,920 x 1,080 pixels)
Glossy IPS touchscreen

Graphics

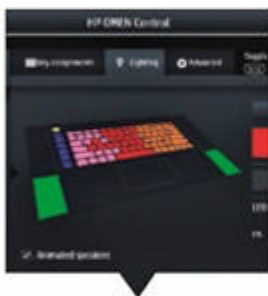
NVIDIA GeForce GTX
860M (2GB GDDR5)

Memory

8GB DDR3L

Price

\$2,299



HP's color customization software allows you to customize the keyboard, speakers, power button and shortcut keys' colors.

IF LOOKS CAN WIN AT GAMING

HP Omen

The new Omen is nothing like its distant desktop ancestor. It's a sleek black gaming laptop with smooth edges and a very angular design. Its 15.6-inch Full HD (1,920 x 1,080 pixels) IPS display packs a hidden surprise for gaming notebooks - a touchscreen, a rarity among gaming machines. In fact, it's the first gaming laptop we've reviewed this year that has one.

Unlike most notebooks, which go for a smooth finish, the HP Omen is textured with teeny squares, giving it a bumpy feel as you run your hand over it. Besides looking unique, it has an added benefit of being easier to grip. It's a little heavier than your standard sub-2kg slim

gaming notebooks such as MSI's GS60 series, but this is because its entire chassis is crafted out of aluminum. As a result, it is extremely solid with a premium feel unmatched by its rivals.

If there's one thing the HP Omen does very well, it's aesthetics. The stylish (and subdued) red lighting that emanates from the rear exhausts is a far cry from the garish lighting on some of the notebooks we've reviewed. The metal bar that serves as a hinge is also unique in that the sides are discolored, reminding us of the burnt titanium exhaust tips often seen on high-end aftermarket exhaust systems for exotic supercars.

The display is surprisingly robust and although glossy,

is rather smudge resistant, which is great if you do use it as a touchscreen. The only issue we have is its limited viewing angles. However, when viewed straight on, images are sharp with vibrant colors.

Like nearly every other notebook in existence today though, the HP Omen uses a conventional chiclet-type keyboard, sans a numpad. It does have a set of customizable gaming keys, but like the Logitech G910 keyboard (which also has keys in similar placements), some of the lower keys can tough to hit accurately. Experience-wise, we didn't notice much (if any) difference in feel from a regular chiclet-type keys and as such, shares my same



The textured chassis of the Omen gives it a great look.

CONCLUSION

The Omen has one of the best notebook designs we've seen, but look elsewhere for gaming performance.

disdain. Namely, they're too shallow and aren't really that great for typing, let alone gaming.

There are some compromises when companies constantly try to make slimmer and sleeker notebooks, and one of that for the Omen is the lack of a physical LAN port. Now as a gaming machine, this alone might just make you cry foul, but luckily, HP does bundle a USB LAN adapter. Of course, using it means giving up a precious USB port, so it could still be a problem for you.

HP gets a lot of things right with the Omen. It stands apart from its contemporaries as a modern take of a gaming machine. The design and effort gone in its construction was something that really took us by surprise. We really didn't think this \$2,299 notebook could feel and look so good. To be honest,

we expected plastic, not the sleek, svelte aluminum build the Omen showed up in.

However, something had to give and unfortunately, the compromises come from some middling hardware choices. The main concern is its use of a previous generation NVIDIA GeForce GTX 860M GPU, while just about everyone else have already refreshed their lineup to the GTX 900-series. Its battery life is also rather lackluster, lasting around 98 minutes in our benchmarks.

This isn't to say that the GTX 860M has no bite left; it still delivered a reasonably playable 36fps average on Shadow of Mordor on High at 1080p, but only 28fps on Ultra. In comparison, the cheaper ASUS G751JT that comes with a GTX 970M more than doubles the Omen's frame rates at 77fps on High and 55fps on Ultra with the same settings.

The Omen is a decent

attempt from HP at being serious about taking on the gaming market. Its high build quality and attractive design will sit well with a target audience that have been spoiled by the likes of MSI, Gigabyte and Razer that have gone to prove that gaming notebooks can also be slim and sexy. All said and done though, the HP Omen is unfortunately letdown by its choice of last year's hardware and less than ideal power consumption.

by Salehuddin Husin

TESTED & RATED

7.0_{/10}

HWM
SINGAPORE



AT A GLANCE

Frequency response

20Hz–90kHz
(24-bit/192kHz)

Total Harmonic Distortion

0.05% (1kHz,
4ohm,33W)

Signal-to-Noise ratio

127dB (DAC)
123dB (ADC)

Dimensions

147 x 150 x 130mm

Weight

0.865kg

Price

\$499 (black)
\$599 (pearl white)



The Sound Blaster X7 has enough ports to connect a full 5.1 system.

MAKING GOOD SOUND GREAT

Creative Sound Blaster X7

The Sound Blaster X7 is Creative's latest flagship audiophile amp, and they've been pushing it as the "biggest, baddest and boldest" Sound Blaster product they've ever launched till date, embellishing it as such:

It's the product with the biggest array of features of any Sound Blaster product to date, the baddest player in entertainment audio with only the finest of audiophile-grade components, and the boldest in terms of packing a mind-blowing list of features into a compact trapezoidal prism that can be easily connected to your PC and just about anything else.

"Just about anything else" would certainly seem to be about right, as the compact amplifier supports up to full

Dolby Digital 5.1 sound, and offers Bluetooth 4.1 with aptX Low Latency and AAC codec support, so you can hook up anything from a full 5.1 speaker system to a set of wireless headphones for quality sound.

There are two versions of the X7 available at the moment –the regular black X7 and a limited edition pearl white X7. While they're similar in almost every aspect besides color, the pearl white Sound Blaster X7 comes bundled with the higher powered AC/DC adapter that provided up to 100W of power (2x 50W at 4ohm).

It also has a lower headphone amp output impedance of 1ohm compared to the black version (which has a

headphone amp output impedance of 2.2ohm), allowing it to drive headphones with better control and lower distortion. It's \$100 more than the regular black version, but a quick check shows that Creative actually sells the high-powered adapter on the Creative store for \$149, so the pearl white is really a bundle set, with a savings of \$49 instead.

Otherwise, both editions will give you quality high-resolution audio thanks to the Burr-Brown PCM1794 127dB DAC that's coupled to a top-of-the-line Texas Instruments TPA6120A2 headphone amplifier chip, allowing the X7 to drive even the most demanding high-end 600ohm headphones.

You may be keen to know





The op-amp chips are easily accessible.

CONCLUSION

An excellent desktop amplifier that'll give just about any sound system a much-needed boost.

that Creative has made the op-amps of the X7 easily accessible via a plastic hatch at the bottom of the device. This allows you to directly fine-tune the sound of the X7 by switching to the op-amps of your choice; a smart move considering Creative's target audience.

Not to say that the X7 is a complicated device that needs much tweaking. Rather, once the device drivers were installed and we'd selected the appropriate output device (i.e. headphones or speakers), there was little else we had to do as we felt the audio was best at the default settings.

For testing, we used the Beyer Dynamics DT 880 Pro headphones to test the X7, as these have a fairly high impedance rating of 250ohm, making them quite a challenge for any amplifier to drive.

The X7 drove them easily though, running at only about

20% volume for comfortable listening. We thought the X7 managed to improve the performance of the DT 880 Pro by giving it a wider sound stage, better depth in the bass and improved clarity.

As we observed on a recording of The Eagles' Hotel California, the track gained a great sense of atmosphere as the headphones were now better able to pick out the sounds from the crowd, giving you the sense that you were really there.

Likewise, Tiesto's Elements of Life gained much needed body when the DT 880 Pros were powered by the X7. The headphones were able to pick up more detail, and each individual audio source gained better presence, allowing the DT 880 Pro to better create the illusion of enveloping you in sound.

All of our other test tracks demonstrated better detail and more body, and of course high resolution tracks

like a recording of Ottmar Liebert's Fireopal benefited from the extra clarity in the mids, and better overall imaging, as the X7 could properly render all the extra information captured.

Overall, we'd say that the Sound Blaster X7 is certainly a worthy addition to any home entertainment system, as it offers great flexibility in terms of input and output options. The audio components certainly do an excellent job, and the price-to-performance ratio is definitely hard to beat.

by Marcus Wong

TESTED & RATED

9.0_{/10}

HWM
SINGAPORE

AFFORDABLE AND STYLISH

Huawei Ascend P7

AT A GLANCE

Operating system
Android 4.4 KitKat

Display
5-inch 1,920 x 1,080 pixels (441ppi) LCD

Processor
Quad-core 1.8GHz Cortex-A9

Storage
16GB internal storage with microSD support up to 64GB

Price
\$699



The power button on the P7 looks quite similar to the round metallic power button used by Sony on its Xperia Z range.

CONCLUSION

A stylish and affordable mid-range LTE-equipped smartphone.

The Huawei Ascend P7 is the successor to Huawei's previous flagship smartphone, the P6, which at 6.18mm, was the world's thinnest smartphone at the time of its launch. At 6.5mm, the P7 isn't quite as thin, but it's still slimmer than most Android smartphones out there.

Design-wise, the P7 takes some major cues from Apple's iPhone 4, with a boxy rectangular shape and glass front and rear panels separated by an aluminum frame running around the edge of the device. iPhone similarities aside, it's a good looking smartphone and it feels solid and well-crafted too. On the right side of the phone, you'll find the volume rocker, micro-SIM and microSD trays, as well as a circular power button, which looks a bit like Sony's Xperia Z power button. The microUSB port can be found at the bottom of the phone, while the headphone port is at the top.

The P7 sports a 5-inch display with a 1,920 x 1,080 pixel resolution, giving it 441 pixels per inch. Pictures and text look crisp and viewing angles are quite wide too. Contrast is decent with deep blacks, but colors look a little too vivid and over saturated.

The P7 runs Android 4.4 but, as with all of Huawei's smartphones, its Emotion UI is laid over the top of it. As with previous versions of Emotion, the P7 doesn't have an app tray, and instead, all apps are found on multiple pages on the home screen, just like iOS.

The rear-camera on the P7 uses a 13-megapixel Sony sensor, while the front-facing camera is an impressive 8-megapixel shooter that is ideal for selfies. Overall image quality was much better than on the P6, but the P7 still had trouble focusing in low-light situations. There was also quite a bit of graininess and noise present in any photos shot without perfect light conditions.

The P7 is powered by a

Huawei-made HiSilicon Kirin 910T SoC, with a 1.8GHz quad-core CPU, a Mali-450 GPU and 2GB RAM. While that sounds fairly promising, the P7 falls quite far behind in benchmark performance when compared to the flagship smartphones of its competitors, scoring about half as well as the Samsung Galaxy S5 and Sony Xperia Z3 on Quadrant and Ice Storm Unlimited. In actual real life usage, we didn't find the P7 to be too sluggish, but it wasn't as snappy as other flagship smartphones, especially on games and other intensive apps. Simple tasks like web browsing and messaging were fast and responsive.

Battery life on the P7 is provided via a 2,500mAh capacity battery. In our video looping battery test, the phone lasted just over seven hours, which isn't too bad, but is a little under average for a phone of this size.

by James Lu



TESTED & RATED

7.5_{/10}

HWM
SINGAPORE



AT A GLANCE

Macro Buttons

9

Cable

Fixed, 1.82m

Dimensions

210 x 505 x 35.5mm

Weight

1.5kg

Price

\$249



Logitech claims their new Romer G switches can withstand up to 70 million presses.

CONCLUSION

Great keyboard but some ergonomic and app issues detract from the overall quality.

NOT PERFECT BUT NEARLY THERE

Logitech Orion Spark G910

The Logitech Orion Spark G910 full-fledged mechanical gaming keyboard with all the bells and whistles expected, plus a couple of extras thrown in for good measure. Constructed from plastic, the keyboard is light enough to lug around yet sturdy and secure enough (thanks to its sizeable rubber stops) to not move around during 'chaotic' gaming sessions. It interfaces via USB with the wire fixed to the top of the keyboard. Unlike some other mechanical keyboards, the G910 unfortunately doesn't have other USB ports so it can't function as a USB hub.

The keyboard uses a new type of switch Logitech calls Romer G, though to call it simply a switch type is a bit misleading. Instead, think of Romer G as a whole system. Its main function is of course that of a mechanical switch but it also encompasses other aspects of the keyboard's design. The asymmetrical keycap design on the keyboard is entirely new, developed for the

Romer G, as is the lighting system.

Still, as unique as the Romer G keys, they don't feel that much different from generic Cherry MX Brown keys. That may or may not be a good thing depending on your preference, but Logitech might be on to something with its unique construction. The hollow center for the Romer G keys gives a cleaner and brighter backlight to shine through the key markings. We also love the shape of the key caps that guide the fingers in. The shortcut and customizable keys also won us over, despite some positional quirks of the G3 - G5 keys.

It keyboard also has a fancy sounding feature called an Arx Dock, which is basically a pull out cradle to rest a smartphone/tablet running its companion Arx Control app. The app is supposed to offer second screen-like functionality to the keyboard and supported games, but at time of testing, was more trouble

than it's worth.

Ergonomically, our biggest concern is the back legs, which do not offer sufficient elevation for long periods of gaming. We soon felt discomfort in our wrists and expect other users might run into the same problem.

In the end, if you want to try something new, the Logitech Orion Spark G910 is worth considering. It's priced decently for what it offers. As a keyboard, it feels good and offers lots of customization, which is great for any gamer who needs a setup that meets his or her exact needs; even for specific games.

by Salehuddin Husin

TESTED & RATED

8.5_{/10}

HWM
SINGAPORE



AT A GLANCE

Sensor

1/1.7-inch BSI
CMOS sensor

Resolution

12.1-megapixels

Focal length

25–300mm
(35mm equivalent)

Dimensions

108.3 x 61.5 x 36.7mm

Weight

248g

Price

\$579



Flipping up the LCD automatically puts the camera in selfie mode.

GOOD FOR PHOTOS, GREAT FOR SELFIES

Casio Exilim EX-ZR3500

You may know them better for their watches but the niche that Casio has carved for itself in the digital compact camera space is making quite an impact. With the success of their TR-series cameras, Casio is porting some of these features into their other models. Namely, the recently launched flagship in their travel series compacts, the Exilim EX-ZR3500, will not only get an image quality boost, but improved selfie functions.

At the heart of the ZR3500 is a 1/1.7-inch back-illuminated CMOS sensor that's said to be taken from the EX-TR50. Casio is touting the ZR3500 as having the best image quality of the entire travel

series to date, capable of giving images that show "each and every strand of hair".

One of the ZR3500's biggest feature improvements is the inclusion of Make-up Plus mode—also derived from the TR50—which allows you to adjust your skin tone and apply a level of skin smoothing to your image. This new function can now be applied on up to ten faces, and the strength of the effects are adjustable via sliders. Noting that men can also benefit from some skin smoothing, Casio has actually added the option for your skin tone to the darker, and you can even set bracketing of the make-up effects if you can't

decide what level to apply.

Touted as a premium travel compact camera under Casio's ZR umbrella, the ZR3500 has a lens with a wide zoom range, covering the 35mm equivalent of a 25–300mm lens. That range can be doubled by engaging the Multi SR Zoom function, which samples multiple areas from the image to do real-time interpolation, thus creating a better final image than what most digital zooms are able to achieve.

That said, the ZR3500 does have digital zoom too, and with that enabled you get 4x the magnification, bringing the max zoom range to 96x. If you're doing the math, that's the equivalent of a 1200mm lens! The trade-off is that



Use the ZR3500 in good light, and you get plenty of detail.

CONCLUSION

A handy pocket-sized camera that's capable of good images with great detail.

images taken at maximum digital zoom are limited to 3MP, as the camera is essentially doing a real-time crop for you.

While these images will necessarily become grainy from the interpolation, we must say that they still look decent on-screen, so if your application requires for the images to only be viewed on screen or printed at small sizes, then the image quality of images taken with digital zoom are certainly at an acceptable level.

Of course, having that much zoom reach also means that you'll need to keep the camera steadier as every shift of the lens will be magnified. It's true for full-sized lenses, and applies to compact cameras too. The ZR3500 continues to feature Casio's HS

Anti Shake 5-axis image stabilization with two settings – "normal" and "strong". We had it set to "strong" when we were testing the extents of the lens, and found that the image stabilization generally worked well, with minimal blurring.

As with most compacts these days, the ZR3500 features a quick access menu that you can get to easily by pressing down on the main dial pad. Different options will be enabled depending on which mode you're in, and of course there are several modes with presets for easier shooting. In particular, we found the magnifying lens mode made for a much quicker way to get the camera into a mode suitable for macros, so it may well

suit you to spend some time going through all the modes even if you're a seasoned user.

Overall, we thought the ZR3500 captured images with good color and detail when used in good light. The face-detect autofocus does seem to work as advertised, picking up all the faces in every group shot we took, and of course the make-up feature proves to be quite the crowd-pleaser in providing smooth skin, thus validating the camera's selfie prowess.

We do like the zoom range on this pocket-sized camera, and the focusing speed is generally quite fast across the entire range, making it a great alternative to a larger interchangeable lens camera if you don't need the higher resolution. Images taken at higher ISOs (above ISO 2,000) start to exhibit smudging of details as the camera attempts to compensate for noise, so try to shoot in better light as much as possible.

by Marcus Wong



TESTED & RATED

8.5_{/10}

HWM
SINGAPORE

AT A GLANCE

Operating system
Android Wear

Display
1.6-inch Transflective
TFT LCD / 320 x 320
pixels (283 ppi)

Sensors
9-Axis (Gyroscope,
Accelerometer,
Compass),
Magnetometer,
Ambient Light

Dimensions
36mm x 51mm x 10mm

Weight
45g

Price
\$298



The SmartWatch 3 can be charged directly via a built-in micro-USB port.

A SMARTWATCH AIMED AT RUNNERS

Sony SmartWatch 3

Sony is no stranger to the wearable market. After experimenting with Bluetooth-enabled watches as early as 2006, the Japanese company was one of the first to launch an Android OS smartwatch with the Sony SmartWatch 1 back in 2012. That was followed by the SmartWatch 2 in 2013, and last year, Sony released the third iteration in the series, unsurprisingly named the SmartWatch 3.

While manufacturers like LG and Motorola have been experimenting with round smartwatch faces, and others like ASUS have tried to capture the elegance of high-end watches with premium leather straps and stainless steel and rose gold builds, Sony has opted for a more sporty look, with a square face and a no nonsense black rubber strap

that encases the screen. The back of the watch is actually stainless steel and a nice premium touch, but it's completely hidden by the strap. As a result, the SmartWatch 3 looks more like a fitness device than a regular watch.

It's not unattractive, but it doesn't have the same elegant dressy feel as the metal and leather Moto 360 and ZenWatch, nor the tough sports watch feel of the G Watch R. The plain square face and black rubber strap are a little dull, and the watch looks a bit too much like a tiny computer strapped to your wrist for our tastes. It's definitely more geek than chic. Having said that, the flexible rubber strap is quite comfortable to wear, and the watch itself is fairly slim and light. The deployment clasp strap is easy to set

up for your wrist size, and it's also fast and simple to put on and take off. You can actually remove the entire watch module from its strap (just pop it out), and swap the strap out for a different color or style if the black rubber isn't to your liking. Unfortunately, it won't take a standard watch strap, so you'll have to make do with one of Sony's custom straps.

The SmartWatch 3 has a 1.6-inch square display with a 320 x 320 pixel resolution (283 ppi). In terms of clarity, it's about as good as the other Android Wear smartwatches we've seen, and it's also fairly bright. Unfortunately, the display has a very obvious yellowish tinge to it and, as a result, everything looks much warmer than it should. Viewing angles aren't great either, meaning you have to





A range of custom straps, including a stainless steel bracelet are available for the SmartWatch 3.

CONCLUSION

With built-in GPS, IP68 rating, and a sporty design, this smartwatch is more fitness than fashion, but lacks the crucial heart-rate monitor.

look straight at it to get an optimal view.

The SmartWatch 3 runs Google's Android Wear OS, which, unlike Android on smartphones, is basically identical for every manufacturer. As with all Android Wear smartwatches, Google Now style cards will pop on your home screen, and can be opened to see more information or swiped to dismiss. The watch also accepts voice commands, which you can use to search the web, set alarms or check your schedule. The SmartWatch 3 performed fairly well on all of these tasks, and its microphone is good enough that you don't need to speak directly into the watch.

One of the features that sets the SmartWatch 3 apart from other Android Wear watches is its built-in GPS, which means you can go running with it and have it track your distance and location without bringing your phone out. Others like the LG G Watch R, ASUS ZenWatch and Motorola Moto 360 don't have their

own GPS, relying instead on being tethered to your phone, which can be annoying to bring out with you on your run.

While the GPS tracking is a nice addition, one glaring omission from the SmartWatch 3's feature list is a heart-rate monitor, which really stops it from being a fully featured health device. Considering that almost every other smartwatch out there has some form of heart rate monitor, this seems like a massive oversight on Sony's part.

The SmartWatch 3 is powered by a quad-core ARM Cortex A7 processor. Transitions were generally smooth and it handled Android Wear's various animations without a hitch. Sony has squeezed a fairly large 410mAh battery into the SmartWatch 3, which they say will give you two days of usage on a single charge. In my experience, you'll get about 20 hours out of it, although you can save some battery by turning off GPS. This puts the SmartWatch 3 on par with

other Android Wear watches, but you'll still need to charge it every night.

The SmartWatch 3 charges directly via a built-in micro-USB port rather than requiring a cradle like almost every other smartwatch. On the one hand, this is great because it means you don't have to remember to bring your cradle with you when you're going on holiday, and on the other hand, it can be quite annoying because the sealed cover that protects the micro-USB port is fiddly to remove. It could also possibly wear down over time, eventually compromising the watch's waterproofing.

by James Lu

TESTED & RATED

7.0 /10

HWM
SINGAPORE

DURABLE BUSINESS PRINTS

Canon Maxify MB5370

AT A GLANCE

Print resolution
600 x 1,200dpi

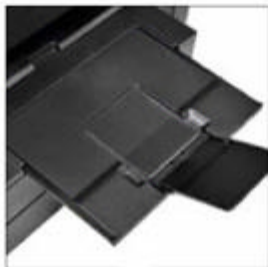
Scan resolution
1,200 x 1,200dpi

Automatic duplex
Yes

Paper Handling
Two 250-sheet trays

Dimensions
463 x 394 x 351mm

Price
\$459



With input and output trays extended, the MB5370's depth can go up to 607mm, so make sure you've enough table space.

Canon's recently-launched Maxify series joins its longstanding Pixma line of printers in its stable of inkjet offerings. But while Pixma printers generally focus on quality photo printing, Maxify appears to merge elements of their Imageclass laser printers, and are geared toward business users.

The Canon MB5370 is the multi-function flagship of the Maxify series, which also includes the MB5070 and iB4070. When it comes to appearances, the Maxify MB5370 looks more like an Imageclass printer than a Pixma printer, all boxy and utilitarian.

As an inkjet printer targeted at the business side of things, the MB5370 comes with two 250-sheet paper trays and a 50-sheet, single-pass, duplexing automatic

document feeder (DADF) for faster scanning of two-sided documents. And in addition to a standard USB 2.0, it can be connected to your office network via LAN or Wi-Fi too.

The MB5370 takes a leaf from the book of the Pixma series with its focus on mobile printing and support for protocols like Apple AirPrint and Google Cloud Print. The Pixma/Maxify Printing Solutions app allows you to print from and save scans to your mobile device. There's also the Pixma/Maxify Cloud link, a service that lets you access your files on social networking sites and cloud storage providers like Dropbox and Google Drive directly from the printer. To add on, you can store your scans to the cloud directly or email them straight to recipients, and even scan or fax to a network

folder for later retrieval.

Then there are the other business-oriented features like Setting and Operations Restrictions. The former lets you set an admin password on your network and device settings to keep out unauthorized personnel, while the latter limits what users can or cannot do on the printer. For instance, you can specify that document copies always be made in black-and-white mode, or limit printing from or scanning to a USB memory stick. The cost-conscious business owner will also likely appreciate additional features like the ability to monitor usage and program the device to turn itself off or on at preset timings.

The MB5370's ability to initiate new tasks while the printer is still printing is then an indispensable function





With the exception of the USB media port that's at the front, the other connections are found round the back of the printer.

CONCLUSION

Fast printing, copying and a useful set of business features make the MB5370 a great start for Canon's new Maxify line.

in a printer meant to serve a group of people, and it is also one of our favorite productivity-enhancing features.

Performance-wise, the MB5370 delivers fast printing and copying speeds and very decent image quality. In our simplex tests, the printer returned print speeds of 24.1ppm for B&W and 15.5rpm for color printing. This is actually comparable to the Canon Imageclass MF217w, which is a \$329 mono laser printer that prints at 23ppm. However, it's worth noting that the average print speeds will vary according to your usage scenario. For instance, we noticed that the printer was quickest at printing Word documents, followed by PDF and Excel files in B&W, simplex mode.

The MB5370's fast print engine also translates directly into good copying speeds, and its twin-CIS (contact image sensor) ADF allows for double-sided scanning in a single pass, which makes it quite quick when copying two-sided documents as well.

The MB5370's lower optical scanning resolution of 1,200 x 1,200dpi compared to the Pixma MX927's 2,400 x 4,800dpi also serves to differentiate itself as a more document-focused, and hence business-oriented printer. It may seem low when compared to the Pixma printer, but it is actually on par with most laser-based, multi-function devices. Nevertheless, the interpolated resolution goes up to 19,200dpi, which can be useful for niche cases like line art.

With regard to image quality, it's difficult to see the difference between the output of the MB5370 and a laser printer at first glance. Closer inspection does reveal that a laser printer still produces sharper and more full-bodied text more consistently, but most users should be satisfied with the MB5370. Color text, graphics, and photos fared a bit worse, with print dots often visible and less smooth gradations, possibly due to the lower resolution and larger ink droplet size. Copy quality is

also average, though it again matches what we've seen from most inkjet and laser multi-function devices with a contact image sensor.

Still, it's worth noting that these new Maxify printers use a new pigment-based ink that's resistant to marker ink and water spills. We've gone over the text with highlighters and even poured a cup of water over printouts, and they came away unscathed.

In sum, the \$459 MB5370 is a compelling laser alternative, offering great value for its feature set and performance when primarily used as a document workhorse.

by Ng Chong Seng

TESTED & RATED

8.5_{/10}

HWM
SINGAPORE

AT A GLANCE

Size
45mm

Water resistance
100m

Movement
Swiss ETA E81.301

Price
\$1,480



The dial has carbon fiber patterns which hide the solar panels underneath.

CONCLUSION

With solar recharging capability, multiple sensors and a touchscreen, this non-smart watch is a rather nice piece of tech.

TESTED & RATED

8.0_{/10}

HWM
SINGAPORE

OLD SCHOOL SMART WATCH

Tissot T-Touch Expert Solar

Tissot has been making T-Touch watches for well over a decade, and it is popular amongst wearers because it combines multiple functions into a single watch. On top of this, it has a touchscreen display, which made it fun to use - this was before the time of smartphones and tablets. However, for years, its users and fans have been clamoring for Tissot to incorporate some form of solar technology into the T-Touch to bring it up to snuff to competing watches from Japanese manufacturers such as Casio and Citizen.

Fortunately, Tissot did just that last year by releasing the new T-Touch Expert Solar watch. This watch maintains the same functions as the older T-Touch Expert, but now comes with solar charging,

which means that if it receives enough solar energy, it should never need to have its batteries replaced.

Since Tissot needed to fit solar panels on the dial, the new T-Touch Expert Solar is slightly larger than its predecessor - 45mm vs. 43mm. It wears large, but thanks to the lugs that curve downwards, it is not too uncomfortable. It also helps that the case is made out of titanium, a material known to be strong yet light, so it does not feel heavy on the wrist too. The T-Touch Expert Solar can be purchased with either a leather or rubber strap. A matching titanium bracelet is also available for those who don't mind a slight premium.

The T-Touch Expert Solar has the standard alarm, timer and chronograph functions that so many other

quartz watches, but since it is targeted at lovers of the great outdoors, it also features barometer, compass, altimeter functions. These can be activated by tapping the watch's touch-enabled sapphire crystal, after which the watch's hands will start whirring and spinning to give you a reading. For wearers who demand more precision, the T-Touch Expert Solar also has an LCD display at six o'clock that shows the readings digitally. The watch is also water-resistant up to 100 meters, so it can be taken swimming.

At \$1,480, the T-Touch Expert Solar is a pricey proposition, especially when you consider that there are more affordable options from Casio's G-Shock and Protrek range that have similar functions but cost less than a quarter of the T-Touch Expert Solar. However, those watches typically have polycarbonate cases, whereas the T-Touch Expert Solar has a titanium case, and titanium is not only an expensive material to procure, but it is also difficult to work with. Furthermore, the "Swiss-made" label on the dial does carry a bit of a premium, as Swiss-made watches are generally considered to be of higher quality, and to the T-Touch Expert Solar's credit, it is a very well made watch.

All things considered, the T-Touch Expert Solar is dependable and rugged outdoor watch that is comfortable to wear, fun to use and works as advertised.

by *Kenny Yeo*



AT A GLANCE

Developer

Ready at Dawn/ Sony Santa Monica

Publisher

Sony Computer Entertainment

Genre

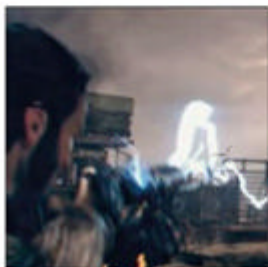
Third Person Shooter

Platform

PS4

Players

1



The Tesla Arc Induction Lance is easily the best and most destructive gun in the game. Too bad you only get to play with it only a few times.

CONCLUSION

Glitzy graphics can only get you so far. Skip the purchase and watch a playthrough on YouTube instead.

TESTED & RATED

4.5_{/10}

HWM
SINGAPORE



MORE MOVIE THAN GAME

The Order 1886

When it was announced at E3 a while back, The Order dropped jaws. It was hyped up as true next generation gaming and at that moment in time, it probably was. Too bad that it didn't turn out that way.

The Order is set in an alternate history Earth where humanity evolved into two different paths; normal humans and half-breeds (werewolves) who are constantly warring with each other. There's a quite a bit of backstory to the game but the thing is, most of it is left hanging in the air, due to the game's short length. I personally clocked in under five hours, playing through the game on Hard. That playtime is inclusive of me dying a few times as well as watching all the cutscenes (which can't be skipped), which trigger so often that you'll swear you spend more time watching than playing.

As a cover based shooter, you'd have thought that The Order would at least get

that part right. Yes and no. It does control rather well and gunplay feels good, but it's also safe and generic. There's nothing new or even exciting about it, no weapon upgrades or RPG elements to make combat anything other than a necessity. You shoot people because they're shooting at you.

Enemy variety is lacking too. Despite all the hype of The Order going up against the half-breeds, you only legitimately fight them a handful of times (with two of them being boss battles). Most of the time you'll be fighting against regular humans. Despite the game showing vampires and hinting of other otherworldly creatures, you only ever fight werewolves and humans in the game. Why tease other enemies if you're not going to be able to tangle with them at all?

Whatever strikes The Order has going against it though, graphical quality isn't one of them.

To say that the game looks incredible is an understatement. It's not hyperbole to say that The Order is pretty much the prettiest game on consoles at the moment. There's nothing that even comes close to the visual quality of the game. Rounding out the whole package, the sound is suitably atmospheric. The Order's theme is regal yet a bit melancholic (which is strangely fitting) though the rest of the score is pretty generic period pieces. Voice acting is a bit of a hit or miss, though the actor playing Galahad is decent enough in his role. Since it's his voice you'll be hearing the most, I guess that's a pretty good thing.

The Order is obviously Sony's attempt to start a brand new IP on the PS4 but with the current gameplay being what it is, will anybody care enough to give the inevitable sequel a shot?

by Salehuddin Husin

AT A GLANCE

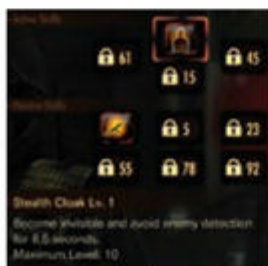
Developer
Capcom

Publisher
Capcom

Genre
Third Person Shooter

Platform
PS4

Players
1 - 2



Hunk's Stealth Cloak skill is arguably the best skill for Raid Mode.

CONCLUSION

It's nothing new or revolutionary, but the budget price and Raid mode makes it a worthy purchase.

TESTED & RATED

7.0/10

HWM
SINGAPORE

BUDGET EVIL

Resident Evil Revelations 2

Capcom's Revelations spin-off series seems to have gotten a life of its own. Despite the '2' at the end, Revelations 2 (R2) barely has anything to do with the first game. Instead, R2 takes place after the events of RE 6, with Claire and Moira being kidnapped, brought to a mysterious island and forced to fight to survive. Like Resident Evil and Resident Evil 2, R2 has two campaigns, Claire with Moira and Barry with Natalia. The game's broken into four different episodes, with each episode having both Claire and Barry sections. The episodic nature means the game is shorter than expected, even with the copious amount of backtracking.

The Revelations series is supposed to take the series back to its survival horror roots, but doesn't really succeed too well. When it does, it relies on cheap jumpscare (instead of suspense or horror) to get the adrenaline going. There's

no 'survival' to the horror too as surviving's incredibly easy because you can replay episodes to stock up on ammo and health.

Playing as Claire or Barry allows you to use guns, though you can also play as Moira or Natalia. Moira and Natalia both can spot hidden items, while Moira also can stun enemies and Natalia can see where enemies are through walls. Playing as either is fun and gives a new twist to an otherwise unremarkable game, though the plot has massive revelations for the Resident Evil mythos. So if you're a fan of the lore, you need to play the game.

While the main game won't last you long (despite its unlocks), the game's Raid Mode definitely will. Raid Mode is a gametype with RPG elements. You choose from a handful of RE characters, select a mission and then play. Each character has their own levels and upgradable skills. Weapons can either be bought or

found in chests in missions. Raid Mode's RPG elements make it very addicting as you constantly get more powerful guns and skills as you play. In fact, I enjoyed Raid mode more than I enjoyed the game proper, especially when played in co-op. The only drawback is the limited number of Raid maps available, with most of them being taken from RE 6 and Revelations.

The game's low budget can easily be seen in the graphics and cutscenes. The textures and characters look last gen, though at least the framerate is constant. Same goes for the sound too. They sound low quality when compared to previous games.

R2 is a passable RE game but it's nowhere near the quality of the original RE games or even the first Revelations. But for \$25 though, it's more than worth it, especially if you're into Resident Evil.

by Salehuddin Husin

FEATURE

OF SELFIES AND WEFIES

Tales from CP+ 2015, or how the awkward self-portrait is dominating digital photography culture.

Japan's biggest camera show, CP+ or Camera & Photo imaging show as it's otherwise known, features the latest and greatest photographic equipment from an assortment of manufacturers. Yet the one thing that stood out this year wasn't hardware-based, but rather the evolution of a trend.

Text by *Marcus Wong*



WHAT CP+ 2015 SHOWED US

Japan's annual Camera & Photo Imaging Show has always been a treat for photography fans, whether it's because of the abundance of models (both human and photographic), or the plain charm of the Japanese exhibitors who always do their best to accede to our requests despite the difficulties in language. There's always a large crowd of camera-toting fans – many of them with extremely serious gear – and plenty of talks and presentations on photography and imaging issues, though they're still only conducted in Japanese.

We were there to get a sneak preview of Casio latest cameras – the ZR3500 and the ZR2000 – and of course, to take in all the sights. Both cameras fall under Casio's "Travel selfie" line, and both feature back-illuminated CMOS sensors, wide zoom ranges, image stabilization, Wi-Fi support and advancing features that cater specifically for selfies, like multiple face detect autofocus, LCD screens that flip up 180 degrees and advanced make-up functions.

CREATING A NICHE

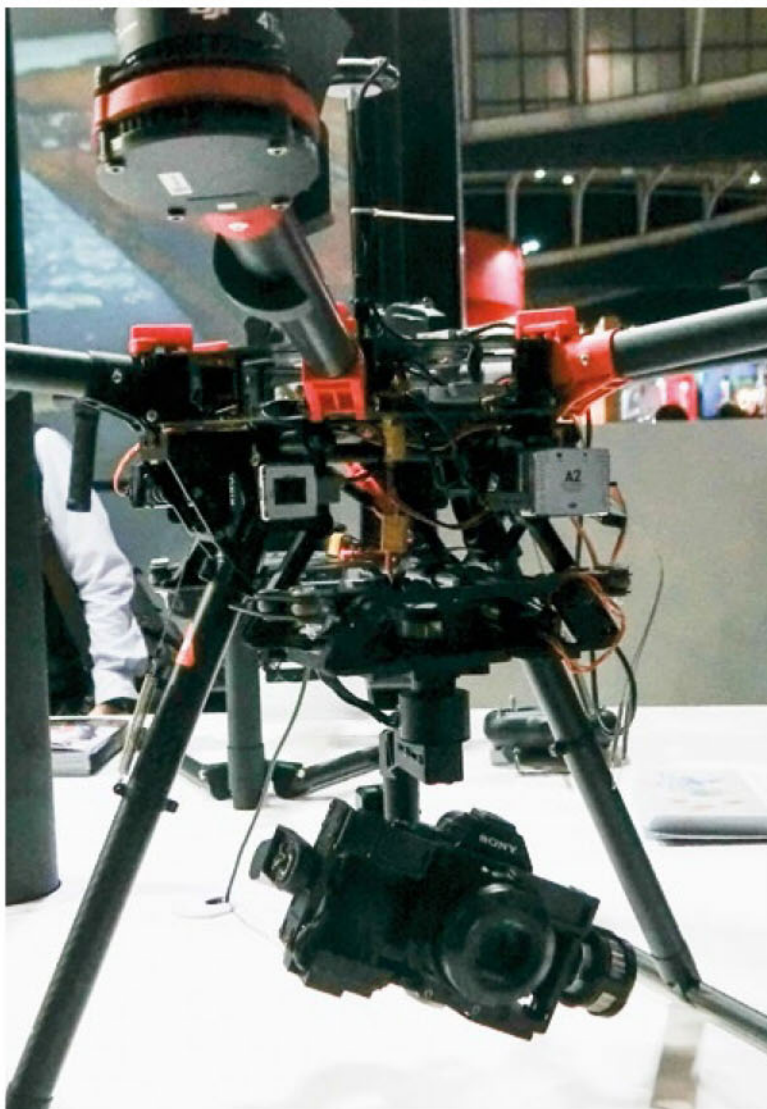
The selfie (and now the wefie) is and has been the greatest selling point for Casio cameras in the past few years. It's a niche they've taken up separate from all the talk about megapixels, resolution and low ISO sensitivity. And now, this trend is fast becoming a request from customers that more camera companies are finding themselves having to accede to.

Call it the need for everyday photos to share with friends and family, with the option of getting a layer of retouching applied in-





"Simply being able to take a selfie with your camera is now passe; consumers want the camera to be able to stand unsupported, or be easily mounted on a support so that they can get wefies with their friends too."



camera for professional-looking effect? Simply being able to take a selfie with your camera is now passe; consumers now want the camera to be able to stand unsupported, or be easily mounted on a support so that they can get wefies with their friends too.

On that note, face-detect features now have to support multiple faces as the "group shot" remains a mainstay of photography. It's almost a sense of natural evolution from the selfie, and Casio is staying on top of the game by improving their in-camera make-up function so that it can be applied on up to 10 faces in a single shot.

A GROWING TREND

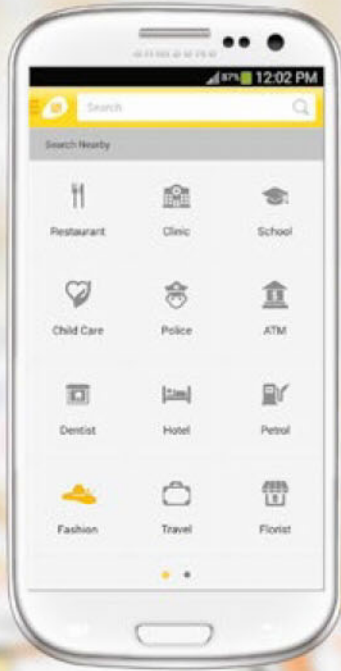
Other brands too are finding it hard to ignore. Panasonic has incorporated make-up functionality in their latest Lumix GF7 camera, with the option to adjust the level of retouch as well as a "slimming mode" that again has three levels of adjustment: weak, strong and none. Also, flipping the LCD up (so it's in line with the lens) jump starts selfie mode, which allows you to trigger the shutter by waving, or by detecting if your face gets close to someone else – i.e. a wefie. – then starting a count-down to the release of the shutter.


Meanwhile Sony's Cybershot DSC-KW11 is a thousand-dollar camera that takes inspiration from a perfume bottle with a lens mounted on a swivel for easy selfies. The camera features a 19.2-megapixel Exmor RS CMOS sensor with a 21mm f/2 lens (35 mm equivalent), and so is certainly quite a step-up over what you might find in a smartphone, and it too offers effects like Skin Toning and Skin Smoothing – all adjustable to your preferences.

If the specs of these cameras are anything to go by, then perhaps this is as a good time as any to recognize that the selfie/wefie camera is a serious segment all on its own. More importantly, it may be the reason to start carrying dedicated cameras once again. Casio is still at the head of the curve of this niche culture that their iconic TR-series cameras jump-started, but competition is heating up with more and more players joining the fray.

The selfie? That's so last year. 2015 will undoubtedly be the year of the wefie! **HWM**





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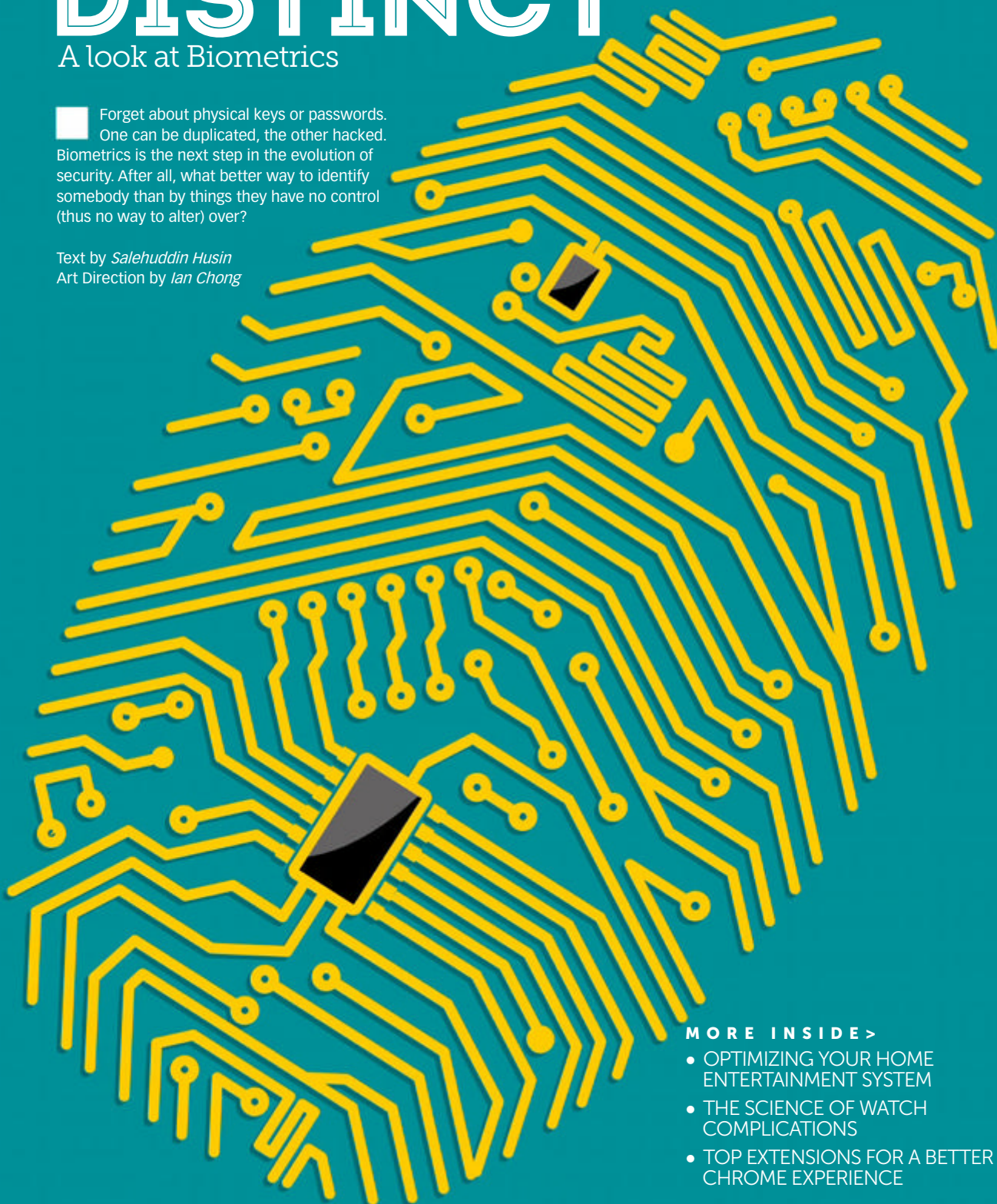
LEARN

BIOLOGICALLY DISTINCT

A look at Biometrics

■ Forget about physical keys or passwords. One can be duplicated, the other hacked. Biometrics is the next step in the evolution of security. After all, what better way to identify somebody than by things they have no control (thus no way to alter) over?

Text by *Salehuddin Husin*
Art Direction by *Ian Chong*



MORE INSIDE >

- OPTIMIZING YOUR HOME ENTERTAINMENT SYSTEM
- THE SCIENCE OF WATCH COMPLICATIONS
- TOP EXTENSIONS FOR A BETTER CHROME EXPERIENCE

WE'RE ALL UNIQUE

Fingerprint scanners at banks or government facilities. Facial recognition cameras at sensitive areas. Retina scans for those incredibly high security places. Vein recognition scanners at office buildings. Everybody's seen them at one time or another and probably have been subjected to a couple at one time or another, but do you really know how they work? We do and we're spilling it all.

FINGERPRINT RECOGNITION

One of the older methods of biometric security in the world are fingerprints. It's widely used in all manner of institutions from banks to schools. Finger print biometrics works by comparing a fingerprint taken with the original. The distinctive grooves and ridges, whorls and valleys of an individual's fingerprints are all unique. While there have been discussion on that might not be technically true, finger print biometrics all operate on the assumption that it is. Be it via computer or manually, all fingerprint comparisons follow a basic guideline called ACE-V, which stands for Analysis, Comparison, Evaluation and Verification. In the Analysis phase, the fingerprint is taken in analysed and scrutinized on whether it is usable. Dirt, grime or other factors can influence a fingerprint's readability as they can obscure details that separate one fingerprint from another.

Once that's completed, the fingerprint is taken to the Comparison phase. Comparison is simple in theory. An original copy of the fingerprint is referenced. Nowadays, this phase is done with computers for accuracy and time. If you've watched CSI or any crime movie or drama, you'd have heard somebody mention IAFIS at one point or another. IAFIS is the world's largest database of fingerprints, with over 72 million print records. Of course, not everybody uses AFIS but we're talking about it as an example. Once a copy of the fingerprint is uploaded, programs will then compare minute details of the fingerprint with the original. Every nook and crevice is scrutinized and compared.

Fingerprints are unique but that can boil down to just a crevice being shorter on one fingerprint than on another's. Of course, such small differences are rare but it does happen so sometimes, a variety of similar fingerprints selected for close inspection. This is the Evaluation phase. It's this phase which makes or breaks the whole process. Once a fingerprint is selected as the closest match, it's finally on to the final step, Verification.

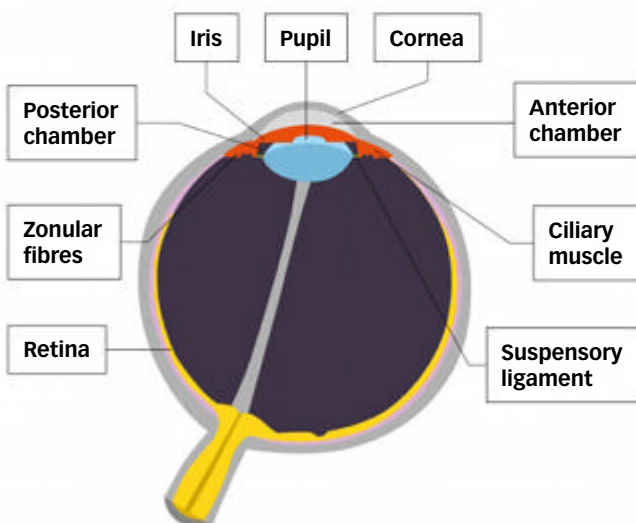
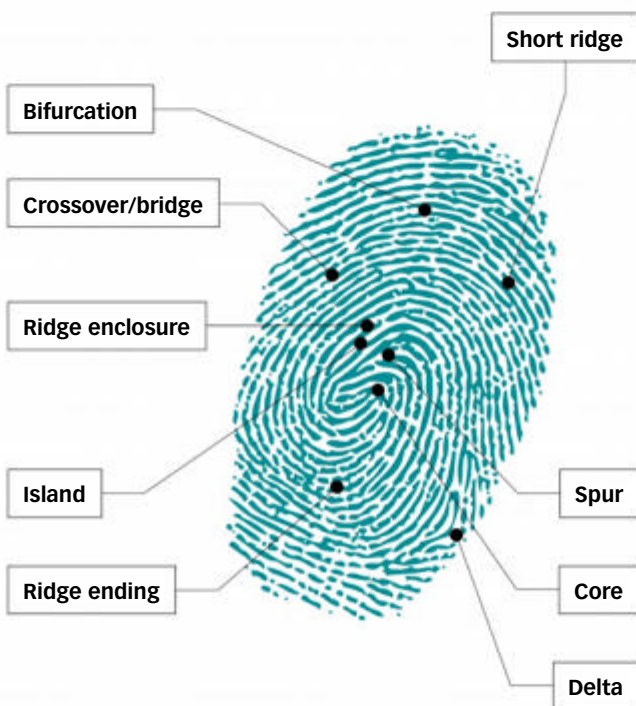
Verification happens differently depending what purpose the fingerprint is being used for. For security access and commercial users, verification is done by computer itself, with no outside party involved, from the initial Analysis phase all the way to the Verification face.

IRIS RECOGNITION

Iris recognition works on the same principles as the other biometric methods, although iris recognition can be a bit of a hassle. For one, it only works if the iris the camera is supposed to be verifying is a certain distance. The sweet spot is 3 – 10 cm, too near and the camera won't recognize the iris. Too far and the same thing happens.

Once a picture is taken though, the computer will break down the iris image into code, similar to how facial features are broken down in facial recognition software. The software takes the measurement of specific parts of the iris; the center and the edge of the pupil as well as the edge of the iris and (weirdly) the eyelashes and eyelids. Once broken into code, the software will try to match the code with one in its database. Iris recognition is much more accurate than fingerprint because there are more distinct and unique points on an eye than there is on a fingerprint - 200 on an iris compared to just 70 on fingerprints.

But first, a general description of what Biometrics actually is. Biometrics is just a general term to describe multiple recognition process. Fingerprint identification is a biometric process, so is facial recognition and even iris cognition. The rule the rule of the thumb is that if something is biologically unique to a person and is not easily reproducible, it could be a biometric identification method. Here are some examples of biometrics and how they work.



FACIAL RECOGNITION

Facial Recognition is a relatively new method of biometric identification. It requires specialized software that is able to recognize faces from other objects. There is a wide variety of software in the market now that does this but all of them use the same basic identification principles. They identify faces using the distance between the eyes, width of the nose, depth of the eye sockets, the shape of the cheekbones and the length of the jawline. Of course, different software might include more stringent measures, but that's the basis of any facial recognition software. More advanced software can even estimate aging, accidents or weight gain and take them into account. While Facial Recognition used to be a wholly 2D affair, nowadays it's all done via 3D for more accuracy.

An image or recording of the subject is sent to the facial recognition software. In the Detection phase, once an image or face is recognized, the facial recognition software will get to work. Upon detection of a face, the software can get the details of it up to a 90 degree angle (if in 3D), in what is known as the Alignment phase. What follows is called the Measurement stage, which has the system measuring the curves on a face and then creating a template. Once that's done, it's off to the Representation phase, where all the details taken down earlier are broken down into a unique code to represent them. That code is then searched among a database for a match, in what's known as the Matching phase.

Out of all the types of recognition mentioned here, the one with that will continue to get better as technology improves is facial recognition. As cameras become more and more able to discern details, it'll only help with improving facial recognition, which means that one that facial recognition software might be advanced enough to incorporate other aspects of biometrics (such as iris scanning) into one single package.



As technology advances, we'll come to a point when facial recognition will be able to tell if you've had plastic surgery done just by a scan of your face.

VEIN RECOGNITION

It may sound gross but vein recognition is actually one of the more fool-proof methods of biometrics. Like irises and fingerprints, veins are completely unique. Identical twins, despite sometimes being able to have mirrored fingerprints, have never been found to have identical veins (mirror or otherwise). It turns out that veins are an even more unique feature than finger prints, with the left side of a person having completely different veins than the right.

That makes vein recognition systems incredibly simple, yet very accurate. Users simply place a finger, palm or wrist on a scanner. A camera then takes a picture of the part placed with near infrared light, which is then absorbed by the haemoglobin in the blood, making the vein appear black in the picture. From here on, it's a simple matter of assigning references and breaking the template into a unique code that can be searched among a database, just like the rest of the methods we talked about.

So there you have it, biometric security and how they work. Now you know what's happening the next time you're being told to look into a camera at an immigration checkpoint.



Veins are a great biometric system because they remain the same no matter your age. From young to old, veins stay in the same place.

THE FIRST BIOMETRIC CONVICTION

Fingerprint recognition is the oldest form biometric identification technique that's still in use today. Fingerprints were found to be unique sometime around the 1850s, by an English Chief Magistrate named Sir William Hershel. It wasn't until decades later, from 1891 onwards, that fingerprint collections were started by enforcement agencies. The first criminal case involving fingerprints was a murder, in which the murderer was caught when a bloody fingerprint found at the scene of the crime was successfully matched to hers.



OPTIMIZING YOUR HOME ENTERTAINMENT SYSTEM

by Marcus Wong



After picking up that nice, large flat screen for your living room, the next thing you'll want for an enjoyable movie experience is fantastic audio. So, we've teamed up with the audio experts at TriTone (www.tritoneav.com) to bring you some tips for setting up your speakers for an optimal experience.

Setting up a decent home entertainment system requires the following:

- **A minimum of 5.1 speakers, with an AV receiver, and a source.**
- **A display such as a TV Screen or a Projection Screen.**

While humans are known to be able to hear tones from 20 Hz to 20kHz, it has been observed in laboratories and anechoic chambers that we are unable to pin-point the direction of tones at 80Hz and below.

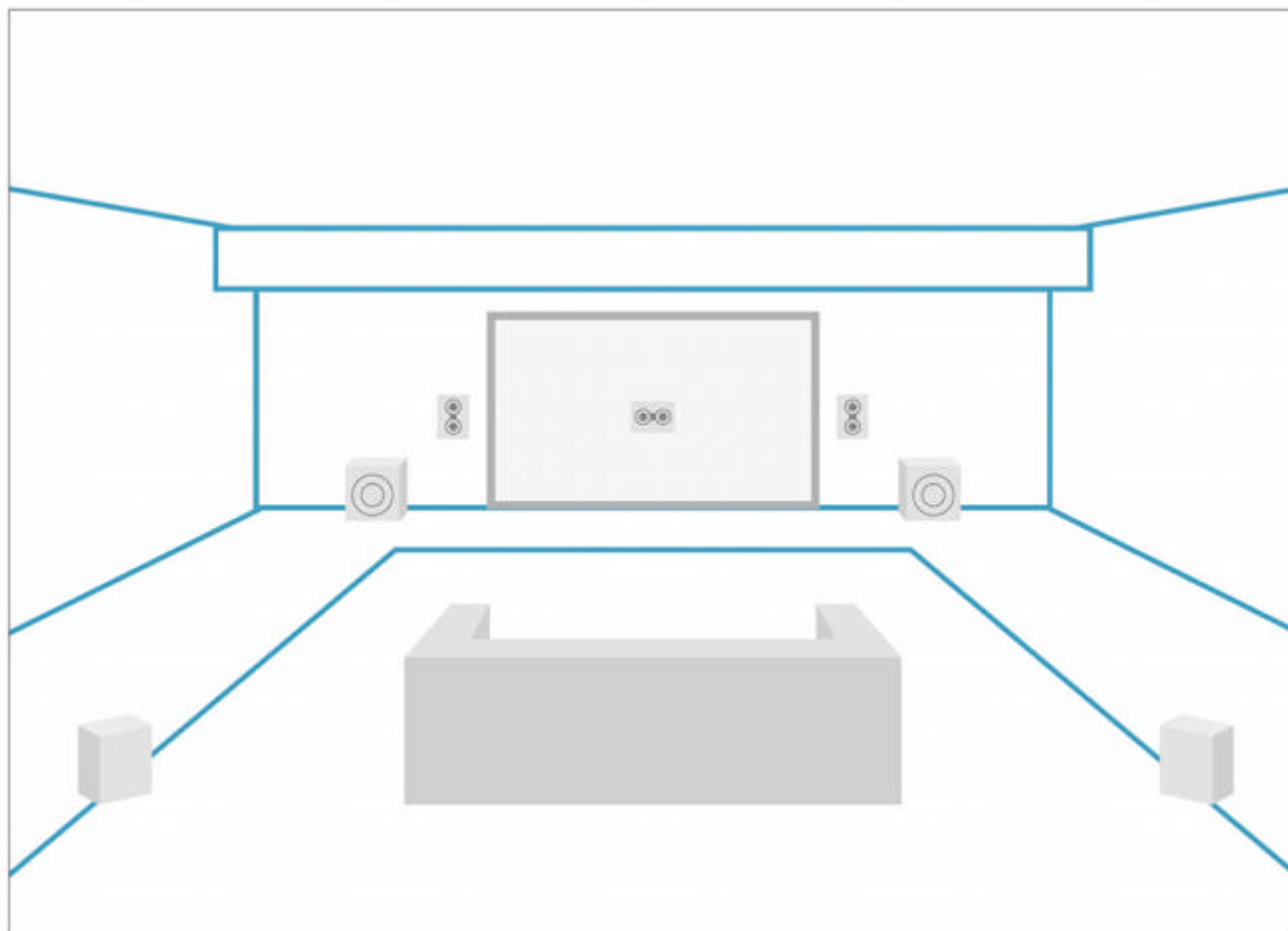
Try to look for subwoofers that can reach a frequency response of between 20Hz to 80Hz, +/-3dB. That's a measurement standard for

most loudspeaker manufacturers, and is considered "accurate".

The smaller the difference in measurement (+/-2dB is more accurate versus +/-3dB rating) the better. The wider the frequency response, the better too.

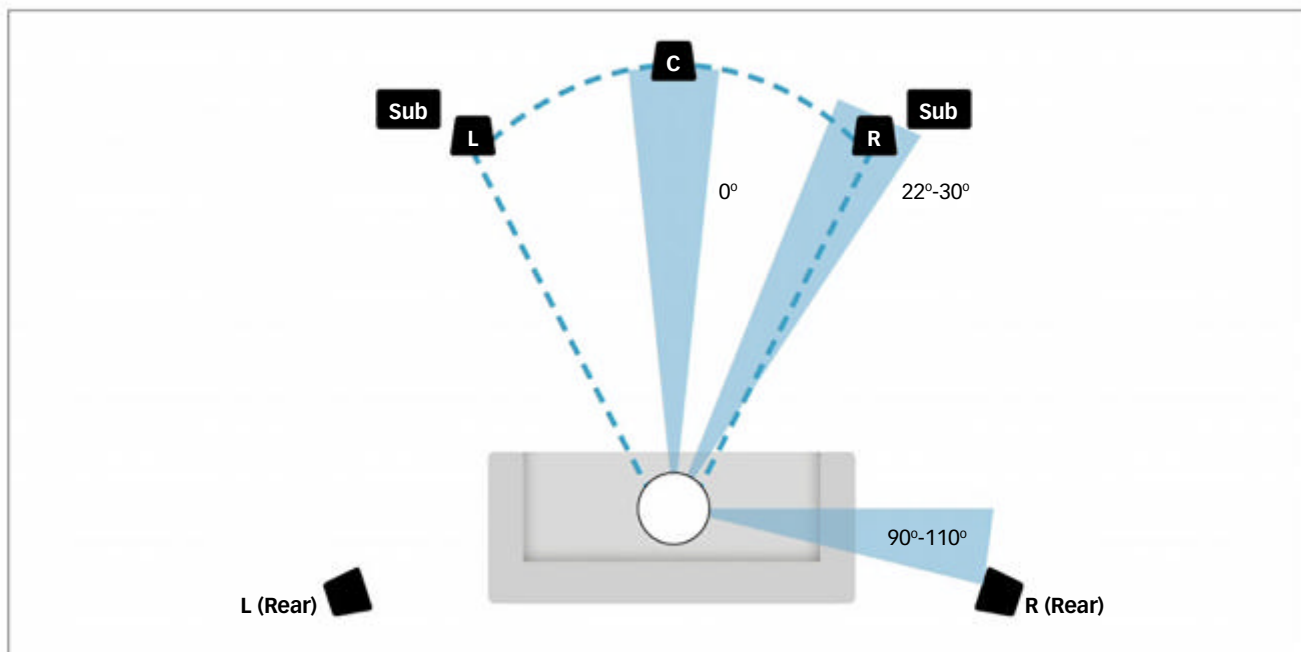
The next elements of a 5.1 system we need to introduce are speakers that will produce the localizable range of sounds for our system. That's to say a minimum range of 80Hz to 20kHz, +/-3dB. Be they smaller satellite speakers that can be surface or ceiling mounted, or larger free-standing tower speakers, more care needs to be paid in their placement.

Here's a recommended layout of speakers in an ideal room condition:



ILLUSTRATIONS IAN CHONG

Here's a recommended placement of the speakers to achieve better seamless surround sound:



You will notice that the center speaker is situated to be right in the middle, behind the perforated or acoustically transparent screen (as they are in the cinemas).

If your display is a television, try to match the height of center channel with the height of the Left and Right as closely as possible to prevent height shifting of details as sound or effects move from side to side. It's like having a recording where the vocals appear much lower than the instruments and distracts the listener from the high-fidelity nature of the reproduction.

PREFERRED SIZE OF SCREEN

Bigger is "better", until you find that you are shifting your eyes corner to corner of the display far too often while watching a movie.

It is recommended that the middle of the display height-wise falls about 15-degrees from your comfortable seating location.

Too big and too high a screen will cause quite a bit of frustration and fatigue as you'll be tilting your neck too high, or rushing to shift your eyes from one corner to the other.

Your speakers and display are the interfacing points of your system to the room and to you, so are the most important elements of a good Hi-Fidelity system.

"BRAIN" AND "MUSCLE"

Speakers need to be powered by amplifiers, which we like to call the "muscle", as they deliver the signal. The higher the power, the less strain it is under when driven hard, resulting in lower distortion. Digital movies and music mediums need to be decoded by a processor, which is the "brain" of the system.

In a system built based on space constraints, an integrated AV Receiver, can be a great solution. These days, receivers also come with room correction software that can be useful in acoustically terrible rooms. However, because they're specifically configured for your speakers, they may push them too far, causing distortion and in an extreme case, damage.

Thus, it's recommended to use such correction software under proper consultation.

WHAT IS 5.1?

5.1 refers to 5-channels, and 1 subwoofer channel. ".1" is so because subwoofers are not capable to play the mid range and high frequencies, and usually stops playing effectively up to 250Hz or so.

If you have two subwoofers, does that mean you have a 5.2 system?

Not necessarily. Often the subwoofer signal is shared with two subwoofers to balance the low frequency effect in a room, preventing the sound from seeming lobe-sided.

There are however, new technologies today that are mastered in the studios with two subwoofers with discreet information.

How does a soundbar compare?

Having speakers at the side or rear helps a great deal with getting the listener more involved in their movies. Most soundbars available at this point have complementing subwoofers that unfortunately need to play above the localizable frequencies, causing the subwoofer to be localizable.

Many sound bars rely on the room's acoustics to provide the surround effect, however, this cannot be consistently achieved due to variations in room acoustics and layout for every single home. Nevertheless, they are decent extensions from the in-built speaker system found in the regular television.



WATCH COMPLICATIONS

In the world of mechanical watches, there are things known as complications. Despite the rather ominous sounding the name, it just means any feature that goes beyond the telling of time. Here are some of the most popular and interesting complications in watches today.

by *Kenny Yeo*

Before smartwatches and quartz watches, there were mechanical watches. They are so-called because they rely on a series of gears, wheels, and springs to tell time. Today, even the simplest time-only mechanical watch consists of over a hundred tiny little components. Imagine the complexity then when a mechanical watch can do more than just display the time. This is why watches with complications are so desirable and highly sought after by collectors.



CHRONOGRAPH

A watch with the ability to measure periods of time is known as a chronograph, or in layman terms, a stopwatch. The earliest chronograph can be traced back to 1816 and was invented by Louis Moinet, a French horologist. However, it was only 153 years later in 1969 that the first automatic chronograph was invented by Zenith. There are also many different types of chronograph.

Monopusher - Most chronographs rely on two pushers - one to start and stop the timing and another to reset. The monopusher chronograph only uses a single pusher to achieve all functions.

Flyback chronograph - While regular chronographs need to first stop and reset itself before it can start timing a new event, a flyback chronograph can reset and begin timing a new event instantaneously.

Double chronograph - Also known as a split-second chronograph, a double chronograph has two seconds hand, one of which can be stopped at any instant while the other continues to run. This allows it to time two events of different durations.



TOURBILLON

Although not technically considered a complication, the tourbillon is nonetheless a very complex mechanism, and watches equipped with one often command stratospheric prices. Prior to the First World War, wrist watches were not commonly worn and most people carried pocket watches. These watches were often kept in the upright position, making it susceptible to inaccuracies due to gravity and errors in rate. To overcome this, Abraham-Louis Breguet invented a mechanism which would spin the escapement and balance wheel in a rotating cage, thus preventing them from being in a fixed position for extended periods of time. This averages out the effects of gravity and errors in rate. He called this invention the tourbillon.



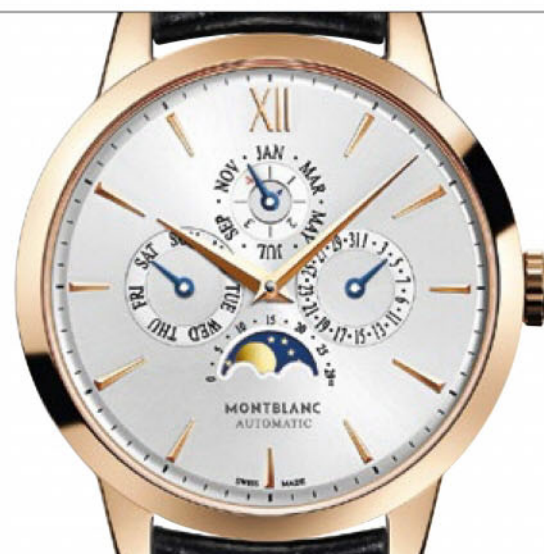
SECOND TIME ZONE

This complication allows the wearer to keep track of a second time zone. A watch with a second time zone often features a second hour hand or, in some cases, a sub-dial with additional hours and minutes. These watches are often accompanied by a rotatable or fixed bezel with 24 hour indications. Such watches are popular with frequent travelers and individuals who need to keep track of multiple time zones. This complication was invented by Rolex at the request of the now defunct Pan Am Airways, who needed a watch for their pilots to keep track of local time and the Greenwich Mean Time.



PERPETUAL AND ANNUAL CALENDARS

Unlike quartz and digital watches, mechanical watches do not know the difference between months with 30 and 31 days, much less that February has only 28 days and that once every four years it has 29 days. Therefore, on months with less than 31 days, owners of mechanical watches with date displays would need to advance the date on their own. The perpetual calendar complication eliminates this inconvenience and is able to adjust automatically depending on the month and it even knows when it is a leap year and will adjust accordingly for it. Annual calendars, on the other hand, are able to automatically advance the date itself in months where there are less than 31 days, with the only exception being February. Simply put, they need to be adjusted once every year in February, hence the name annual calendar.



MOON PHASE

As its name suggest, a watch with a moon phase complication displays the phase that the moon is in. This is a very traditional complication that is often found on classically designed or dress watches. It is also aesthetically pleasing to look at. In the past, it was used by sailors to gauge the tides. Some moon phase watches can display the phase of the moon so accurately that it only needs to be adjusted once every thousand or so years.



STRIKING MECHANISMS

In the realm of high-end watchmaking, otherwise referred to more fondly amongst enthusiasts as haute horology, striking mechanisms are the most revered complications. These refer to watches that have mechanism which can chime the time using a series of gongs or bells. The earliest watches with striking mechanisms can be traced back to the early 1700s, and were made for wearers to tell the time easily at night - during this period, lights were uncommon and luminous materials for watches have yet to be discovered. These watches are extremely difficult to make and were seen as a status symbol. This has not changed much today and such watches remain extremely complex and as such command a very steep premium.

Watches with striking mechanisms can be broadly divided into two categories - sonneries and minute repeaters. There are two types of sonnerie watches, grande and petite sonneries. A grande sonnerie watch strikes the hours and quarters each quarter, meaning every 15 minutes. A petite sonnerie watch only strikes the quarters every 15 minutes - not the hours. A minute repeater is a watch that strikes the hours, quarters and minutes and can do it on demand.

In terms of complexity, sonneries are the hardest to manufacture because the act of striking the time requires a lot of power, and this power has to come from the watch's timekeeping mechanism throughout the day. Hence, a movement with sonnerie functions need to have a lot of power reserve and must be very efficient. Minute repeaters, on the other hand, are slightly simpler, because they are usually activated by a slider, which generates energy for the striking mechanism.



GRANDE COMPLICATION

The term grande complication is often bestowed only on the most complicated of watches. Although there's no official definition, a widely accepted definition is that a watch can only be called a grande complication if it features a chronograph, perpetual calendar and minute repeater. It goes without saying then that this is a tremendous undertaking and only a handful of brands, such as Patek Philippe and Audemars Piguet, can lay claim to having a watch that qualifies as a grande complication.



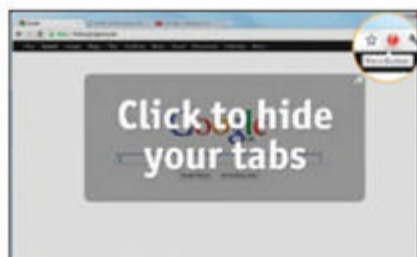
SIX GOOGLE CHROME EXTENSIONS TO ENHANCE YOUR INTERNET EXPERIENCE

by James Lu

Google Chrome is by far the most popular web browser in the world, responsible for an estimated 46 percent of all desktop Internet traffic. But while Google has steadily added improved functionality to the browser over the years, nothing beats the perfect extension to enhance your internet experience. Here are six of the best.

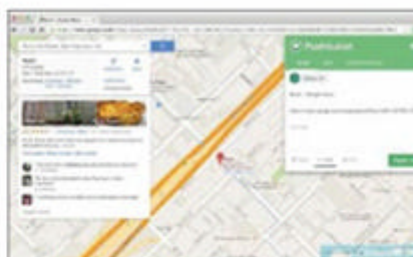
PANIC BUTTON

The Panic Button is an essential Chrome extension for anyone that doesn't want to be caught looking at controversial online content. If you know what I mean. The panic button adds a button to your tool bar that will hide and save all of your opened tabs with a single click, allowing you to quickly hide any incriminating tabs if you have a suddenly unexpected visitor or you need to leave your computer unattended. Once things are back to normal, a single button press will restore all your tabs. Hidden and saved tabs can also be password protected so that only you can resume your shameful Internet activity.



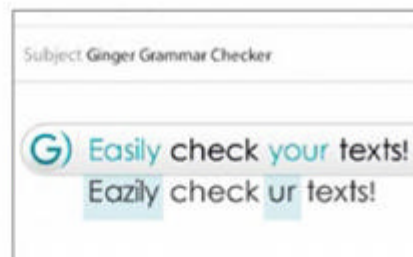
PUSHBULLET

Pushbullet has long been an essential app/browser extension for anyone with an Android smartphone, and it's finally been made available for iOS too. Pushbullet allows you to easily share files, notifications, links and other material between your smartphone and your computer over WiFi (and you don't even need to be on the same WiFi network). You can send notifications like messages and calls right to your desktop, and you can also do the reverse, sending websites, maps, pictures, and files from your computer to your phone.



GINGER

When you're arguing with strangers on the Internet, you know sooner or later someone is going to attack your spelling and grammar. Make sure you're bulletproof with Ginger, a proofreader extension that follows you throughout the web. Whether you're typing out an email, updating your Facebook status, or arguing with idiots on your favorite message board, Ginger will double check your spelling and grammar, highlighting and suggesting corrections for any mistakes. The add-on is multi-lingual too, and can translate and correct text in over 40 languages, so you can always switch to German when things get really serious.



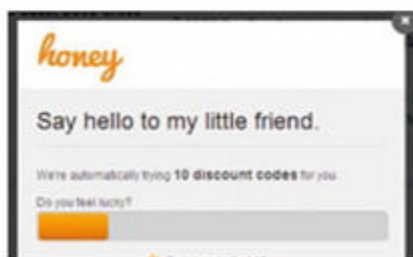
THE CAMELIZER

Ignore its somewhat ridiculous name, The Camelizer is a must-have extension for anyone that enjoys online shopping. The unobtrusive add-on displays product price history information for items sold on Amazon, Best Buy, and Newegg so you can track if it's getting more or less expensive. In addition to viewing pricing trends for any given item, users can also sign up for price drop alerts via email and Twitter.



HONEY

Another must-have for shopaholics, Honey does all the leg work involved with tracking down online coupon codes and discounts for you. Once installed, the extension will automatically find and test coupon codes for more than 100 online stores for you. Simply go about your shopping as normal, and then, when you're checking out, hit the 'Find Savings' button to have Honey track down and attempt to apply coupon codes.



EXIF VIEWER

Have you ever seen a beautiful photo and wondered exactly what camera, lens, and settings the photographer used? If so, EXIF Viewer is the extension you've been looking for. This add-on displays any available information found in the photo's EXIF data, down to the camera used, ISO, exposure, aperture, and even geolocation information if available. While there's no guarantee you'll be able to capture the same shot by copying the equipment and settings, it's a good start.



MAKE MINE MARVEL

Marvel Apps Assemble!

by Salehuddin Husin

With Avengers: Age of Ultron hitting cinemas, April is the perfect time to dive into the big M's (no, not Magneto) cache of apps and games. As Marvel is a huge company; we've helpfully sorted out what's worth spending your time (and money) on.



MARVEL AR APP

iOS, Android
Free



Yes, people still read physical comics. If you're one of them (congratulations, you're a dying breed) and you read Marvel, you definitely need to download the AR app. It's a bit finicky and doesn't work that well with some phones, but the AR app is great in that it delivers content that you might not otherwise see, like character commentaries by the writers or even behind the scenes stuff. You just load the app and whenever you see an AR logo on the pages on the comic, you scan it and you'll be automatically taken to the content that panel unlocks.



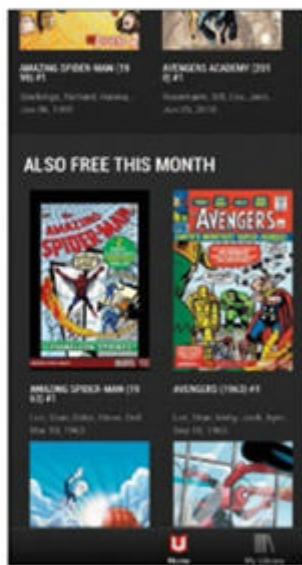
Download the app and when you see any page with the AR icon, load the app and scan it to get extra content.

MARVEL UNLIMITED

iOS, Android
Subscription



Marvel Unlimited is a subscription service with unlimited access to Marvel's library of comics for a flat monthly fee. It's a bit like a Netflix for comics. The catch is that while you do get access to Marvel's full library, it's about six months behind on latest issues (Marvel still wants to sell individual comics). So if you want to read Marvel's past glories like the original Age of Apocalypse saga (or whatever floats your boat) you're all set but don't count on getting the upcoming Secret Wars any time soon. If recent issues are your thing, get Comixology instead.



Great for catching up on past events, not great for current ones.

MARVEL PUZZLE QUEST

iOS, Android
Free



Arguably the most successful of Marvel's current crop of games, Marvel Puzzle Quest combines the seminal RPG gameplay of Puzzle Quest (match 3 colors, with color matches powering abilities) with card collection based elements. Like Contest of Champions, it's free, with support for in-app purchases. Marvel Puzzle Quest is a bit different from most F2P titles in that it's not hampered by an energy mechanic. You can play as much as you want as long as you have characters that are not knocked out.



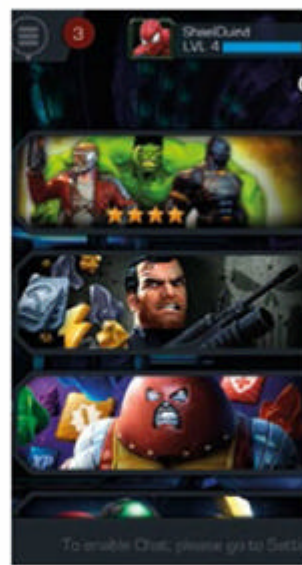
Puzzle Quest has some of the more recognizable characters and costumes in Marvel's history, as well as the obscure ones.

MARVEL CONTEST OF CHAMPIONS

iOS, Android
Free



If Injustice on mobiles had you wishing for a Marvel based fighting game, then Contest of Champions is right up your alley. Featuring a gameplay style similar to Injustice (or Street Fighter if you're unfamiliar with Injustice), Contest of Champions pits a range of Marvel characters against each other. Like any free to play game, it uses the generic energy mechanic, with each quest you do using up one bar. With a variety of story, versus and special events, you have a lot of content to dig through.



There's a whole cast of Marvel characters to pick from, from fan-favorites to relatively obscure ones like the Punisher.

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This Tomy Scramble handheld game, circa 1980s was the epitome of the side-scrolling arcade shooter. It ran on 4 'C' batteries, had only up/down controls and one button.



PHOTOGRAPHY VERNON WONG ART DIRECTION KEN KOH



Lifetime

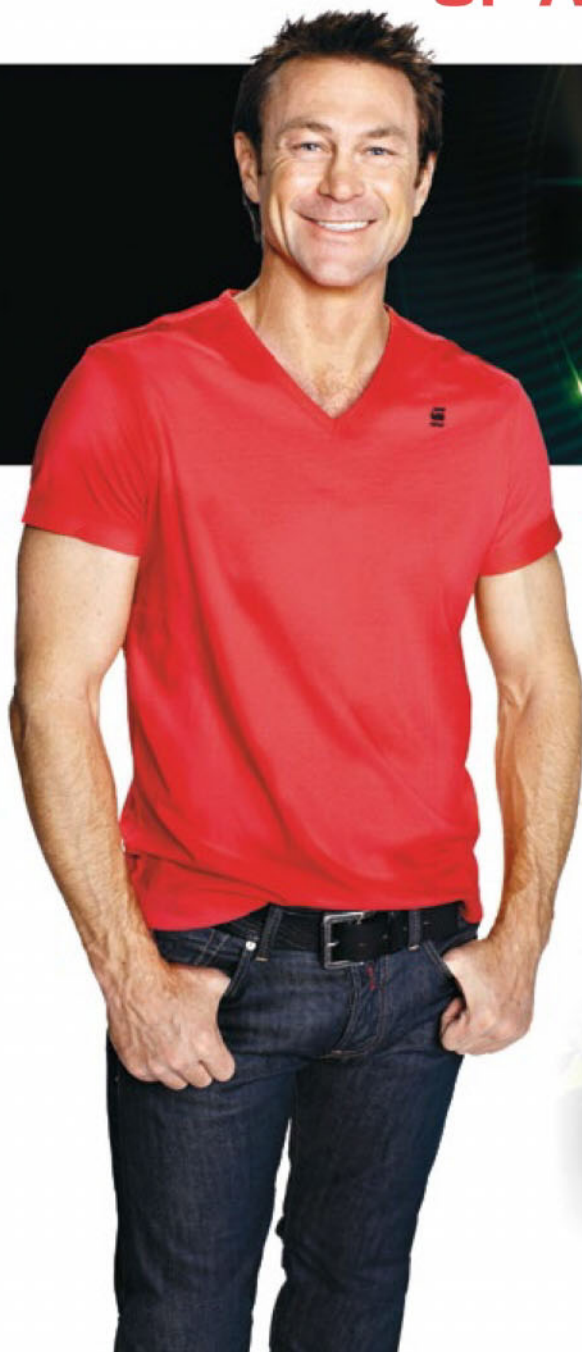
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